

Frontise-Piece

The works of the Lord are great: sought out of all them that have pleasure therein. Psal. CXI. 2.



Loe, these are part of his ways; but how little a portion is heard of him. Job. XXVI. 14.

Frontise-Piece

The works of the Lord are great: sought out of all them that have pleasure therein. Psal. CXI. 2.



Loe, these are part of his ways; but how little a portion is heard of him. Job. XXVI. 14.

A
DESCRIPTION 36

Of a Great Variety of 17 We

Animals and Vegetables;

V I Z.

BEASTS,		PLANTS,
BIRDS,		FRUITS,
FISHES,		AND
INSECTS,		FLOWERS.

Extracted from the most considerable

Writers of NATURAL HISTORY;

A N D

Adapted to the Use of all Capacities, especially for
the Entertainment of YOUTH.

Being a SUPPLEMENT to

A Description of Three Hundred Animals.

Illustrated with above *Ninety* COPPER PLATES,
whereon is curiously Engraven every *Animal*
and *Vegetable* described in the whole Book.

The Treasures of NATURE are inexhaustible!

He spake of trees, from the Cedar-tree that is in Lebanon, even unto the Hyssop that springeth out of the wall: He spake also of Beasts, and of Fowl, and of creeping Things, and of Fishes. 1 Kings. iv. 33.

L O N D O N:

Printed by J. T. for THOMAS BOREMAN, near
Child's Coffee-House in St. Paul's Church-Yard.

M.DCC.XXXVI.

3

DESCRIPTION

OF THE

MINERAL AND METALLIC

VIZ

BRASS, IRON, STEEL, COPPER, ZINC, LEAD, SILVER, GOLD, PLATINA, AND OTHER MINERALS, AND THE ARTS OF SMELTING AND PURIFYING THEM.

Extracted from the most authentic

Writings of the most celebrated

Joseph Banks

Being a Supplement to

A Description of the Mineral Kingdom

Illustrated with many new Copper Plates

whereon is correctly delineated every

and Minerals described in the whole Work

The Pictures of Nature are inscribed

in the Plate of each Mineral, and in the

very early part of the History of the

Mineral Kingdom, and of the

various Arts and Manufactures

LONDON

Printed by J. T. for THOMAS BARNARD

at the Coffee House in St. Paul's Church-yard

MDCCLXXV



To the READER.

THE Description of Three Hundred Animals, the first Essay of this kind, for the use of young People, having been favourably received; encouraged me to make this Second Collection of Animals, and Vegetables; which, I hope, will prove as successful as the former: I have some reason to expect it; because every Invention and Improvement, that tends to delight and please young Persons, (that this does so, is already manifested by Experience) will undoubtedly be a fresh Motive to engage their Attention.

The Minds of Youth, like their bodily Appetites, require to be fed with some suitable Entertainment; the most pleasing Things being wont to cloy by long and frequent Use. Natural History is an inexhaustible Subject, which will furnish them with a boundless Variety of Things, fit to exercise their inquisitive Minds. And I cannot help thinking, that to encourage Youth in reading this Subject, must be of real Benefit, both now and hereafter. It will introduce them into a habit of Reading, from their natural Propensity to view the Pictures, read the Names, and History of the Creatures, &c. which all seem delighted with. But the great and chief Service it will be to them hereafter, is bringing them acquainted with the GREAT CREATOR of all these Things, by contemplating his stupendious Works: It will afford a delightful Satisfaction, to search into Nature, to trace
ber

To the READER.

her Footsteps, and the various Methods she takes to bring her Works to Perfection. Indeed, it cannot be expected, that Children can understand these Things, or be able to make a right Use of them: But by tuition, Persons of the lowest Capacity may be made to know, That the Lord made the earth by his power, established the world by his wisdom, and stretched out the heaven by his understanding, *Jer. li. 15.* And that he hath replenished the Earth whereon we dwell, with variety of Plants, Animals, &c. some for Use, some for Ornament, and some for Delight; which give daily demonstration of the Wisdom, Power, and Goodness of the Maker and Supporter of all these Things.

A new Study seems at first to some Persons hard, intricate, and difficult; but after a little resolution and progress; after they become a little acquainted with it, their Understandings are wonderfully cleared up and enlarged, the Difficulties vanish, and the Thing grows easy, familiar, and pleasant. And sure I am; such studies as these are vastly superior to the Tales, Fables, and Stories of Love, used in Schools, and deserve the regard of Parents and Teachers; as conducing more to the Honour of God, and the real Benefit of Youth. And for our Encouragement in this Study, observe what the Psalmist saith; The works of the Lord are great, sought out of all them that have pleasure therein, *Psal. cxi. 2.* Which though it is principally spoken of the Works of Providence, yet may as well be verified of the Works of the Creation.

A



page 1.

Fig. 1.
Bezoar Goat





A

DESCRIPTION

Of a great Variety of
ANIMALS and VEGETABLES.

BOOK the First.

Of Four-footed BEASTS.

Fig. 1.



It is a kind of WILD GOAT bred in the *East-Indies*, which is call'd, in *Latin*, *Capricorn*; because they partake of the Deer and Goat. The Inhabitants otherwise call them BEZOAR, from whence the Name of *Bezoar* arises. This Animal is very nimble, so that he will skip from Rock to Rock, and is dangerous to the Hunter; for he will defend himself, and sometimes kills the *Indians* that pursue him. The Head of this Creature resembles that of the He-goat. The Horns are very black; and are bended almost to his Back. The Body is covered with an ash-colour'd Hair, inclining to red, much shorter than that of the Goat, and nearest to the Deer's. The Tail is short, and turns up again: The Legs are pretty thick; and the Feet are cleft, like those of the Goat. *Bezoar* is a Stone, produced in several Parts of the Belly of this Goat. It is taken, likewise, out of the Bellies of certain other Animals in the *East-Indies*. It is found in Balls of different sizes and shapes; for some are as big

as a Wall-nut; others as a Hazel-nut, (this sort, they say, is taken from a kind of *Ape*, that is found particularly in a certain Island of *America*) and some as a large Pea. Some are round, others oval, flat, or bunch-ed. The Superfices of all the sorts are smooth, polish'd, shining, of an olive or grey Colour; and is made use of in Medicine.

Fig. 2. The MUSK-GOAT is of the shape and colour of a Hind, only it has a longer Body: It is produced in the Kingdoms of *Boutan*, *Tunquin*, and several other Parts of *Asia*. It frequents the Woods and Forests, where they hunt it; and when it is kill'd, they cut out the Bladder, or Pouch, as big as a Hen's Egg, which is found under the Belly; then they separate the coagulated Blood, which they dry in the Sun, and reduce to a kind of light Moss, almost powder'd, of a dark reddish Colour. This acquires a strong disagreeable smell. They then wrap it up in Bladders for Transportation. And this is the Musk we use. There are a prodigious number of Animals that yield Musk, chiefly in the Kingdom of *Boutan*. They catch them usually at Spring-time, or in the beginning of Summer: For after they have been almost starv'd, during the Winter, because of the Snows, that fall in those Countries ten or twelve foot deep, they come to seek for Food; their Blood being then in a great heat, and violent fermentation. The Musk then taken is likewise strong and spirituous, which is the reason they do not expose it for some time to dry in the Air, lest it should quite destroy the smell. They cannot take a great deal of Musk from any one of these, Animals, because they have but one Cod a piece, which does not yield above three Drams of Musk dry'd. They say, that the Bag, during the rutting of this Creature, has an Abscess form'd in it; which when fully ripe, it makes the Beast itch, and rub himself against Stones, Rocks, and Stumps of Trees, till he breaks it; and it is this Corruption, that when it is spilt and dry'd in the Sun, becomes Musk. There is no impossibility in this Story; but yet it is not to be thought, that all the Musk we have, is taken from these Abscesses. For,

*Fig. 2.
Musk Goat*





Fig. 3
Shamoy

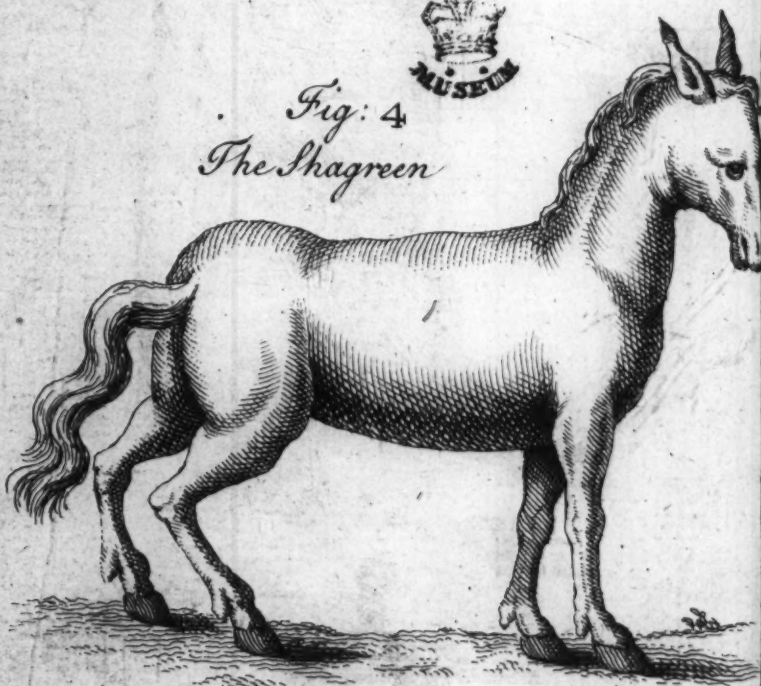


Fig. 4
The Shagreen

is it likely, that they can follow the tract of these wild Beasts, through the Woods and Forests, to gather up this matter; which they have thrown sometimes into Places inaccessible, into Mire and Sands? If we had no other Musk but that, it would be much scarcer and dearer than it is.

Fig. 3. The SHAMOY, or ROCK-GOAT, is a wild Goat no bigger than the common Kind, which frequents the Rocks and high Hills; as the *Alps*, *Pyrenees*, &c. The Horns of this Animal are oddly turn'd, for they rise upright first, and then wind forward like a Hook: It feeds upon the Plants that grows on the Sands, and tops of the Rocks. 'Tis a very shy and timorous Creature: It is coated like a Faun, having a streak running all along the Back. There is a great Trade carried on with these *Shamoy* Skins; by which they convey Oil, Wine, and other Liquids, out of the mountainous Countries; and of which they make several other Uses: for these *Shamoy* Skins, being dressed, are converted into Gloves, Breeches, &c. Because they may be washed as Linnen is, and likewise be dyed into what curious Colour you please. Sometimes in the Bladder of these Creatures is found a Stone, which is call'd *German Bezoar*, because the *Germans* esteem this not inferior in Virtue to the Oriental *Bezoar*. The volatile Salt and Oil, of which these Creatures, both Male and Female, afford abundance; are esteem'd of very excellent Use in Physick.

Fig. 4. The SHAGREEN is a Beast (as represented by Mr. *Pomet*) very much like an Horse or Mule; and is very common in *Turkey* and *Poland*, which the *Turks* and *Poles* make use of to carry their Baggage, as in other parts they do Mules, Horses, &c. When this Animal is dead, they take the hinder part of his Skin, and hang it in the Air, after having strewed it, when raw, with Mustard-Seed. They leave 'em thus expos'd to the Weather several Days, then take them in and tan 'em; and when they are dressed, export them. This Skin is very hard when dry, and soft when steep'd in Water. It is said, that what makes

this Skin so hard, is because the Animal sits down, and rests very much on his Buttocks. They bring two Sorts of Shagreen from *Turkey*, viz. the grey, or ash-colour'd, which is the best; and the white, or salted Shagreen. The Use of this Shagreen is very universal for all sorts of Pocket Utensils, Watch Cases, Toys, &c. They may dye these Skins what Colour they please; but the most common are black, green, and red. The most beautiful and dearest, is the red Colour, because of the Vermilion and Carmine with which it is dyed. Shagreen Skin is often counterfeited in Work.

Fig. 5. The ANTELOPE is shap'd very much like a Deer; and about the same bigness; of a chestnut Colour, and white under the Belly. His Horns are almost straight from his Head up, tapering gradually, with Rings like a Screw, till within an Inch and an half of the top. It has fine large black Eyes; a long and slender Neck, Feet, and Legs. There are many of these Creatures in an Herd; when at the same time they have Scouts, who by running give them Notice of an approaching Foe. They are taken by shot, &c. being too swift for a Greyhound. The Antelope in shape and beauty excels most of the four-footed Race. This Creature is described in the *Book of Three Hundred Animals*; but the Figure there being very faulty, nothing like the Antelope; and having since an Opportunity of a true Draught taken from the Creature itself; I hope giving it double will be excused.

Fig. 6. The SEA-SKINK is a small amphibious Animal, living both on Land, and in Water. It is pretty much like a small Lizard. Many of these little Creatures are to be found about the River Nile in Egypt. They are about half a Foot long, and an Inch diameter, having a sharp Nose, cover'd with Scales. It has two little piercing Eyes. The Mouth is divided, reaching to the place where the Ears should be seated, had this Creature any. It has a great many little white and red Teeth: It goes upon four Feet, little more than an Inch long, which
are

Fig. 5.
The Antelope

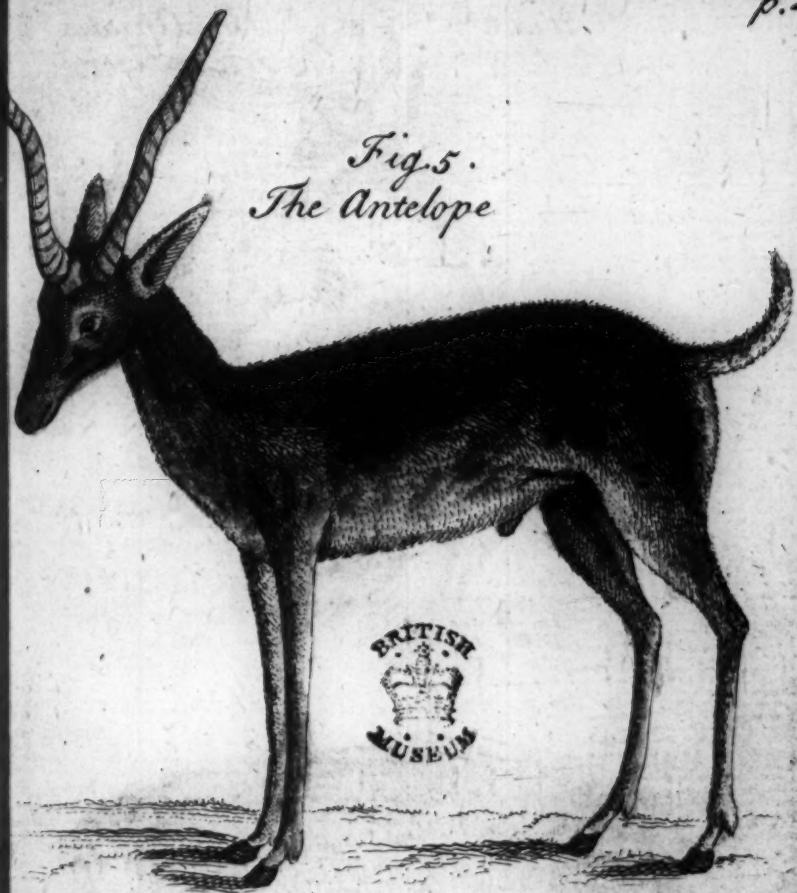


Fig. 6. The Skink

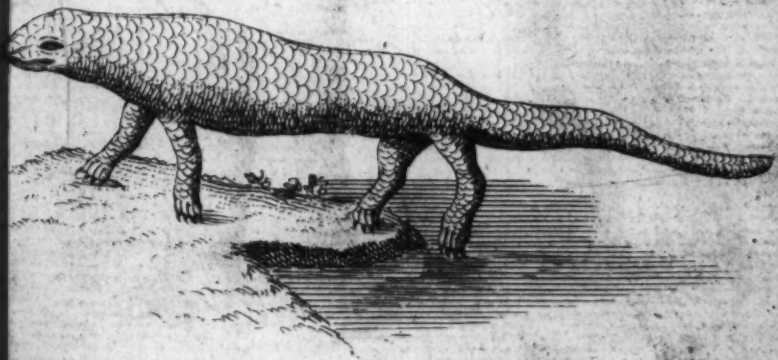


Fig: 8

*The African
Man-Tiger*



Fig: 7. The Indian Man-Tiger

are very much like those of an Ape's. It is cover'd with little round Scales, different from those of the Head, that are long and large. It is of a greyish Colour, inclining to brown upon the Back, and of a silver grey under the Belly. The Flesh of this Creature is used in Physick.

Fig. 7. The MAN-TIGER is bred in *Africa*; &c. It is of the bigness of a large Ape or Baboon; of a brown Colour on the Back and Sides; the Belly, Neck, and Throat, of a whitish Colour; the Buttocks and Face of a light blue: It has a bunch of Hair standing up on the top of the Head; and another, resembling a Beard, hanging under the Chin: The Vent of this Animal is placed very high on the hinder part of its Back. It is a Beast that participates much of the subtle and mischievous Nature of Apes and Baboons; but much more bold and fierce. Some Writers have confidently asserted, that some of these Creatures have had the boldness to attack the Chastity of Women. Mr. *Bradley* mentions one sort of Ape brought from the *East-Indies*, that is very vicious; and he knew one that had more than once attempted to force a Servant of the House where he was kept. The *Man-Tiger* is thought to approach the nearest the Human Species, both in Form and Sense, of all the Brute Creation.

Fig. 8. Is a MAN-TIGER brought from *Africa*; which differs something from the former. It is copied from the Figure Mr. *Bradley* exhibits, in the *Works of Nature*. *Fig. 7.* is from a Painting by a good Hand, from the Creature itself.

6 A DESCRIPTION, &c.

Fig. 9. This little Creature is found at *Surinam*. Merian calls it, a sort of **WOOD DORMOUSE**: It carries her young Ones with her, on her Back; five or six of which, she brings forth at a time. It is of a yellowish brown Colour, but its under part is of a whitish Colour. When she goes out to seek for Food, her young Ones run about her; which, when they are full, or in danger, or for weariness, immediately mount upon their Mother's Back, and twist their Tails round the Tail of the old one, who forthwith carries them into her Hole.





Fig. 9. Wood Dormouse.

Fig: 1
The Avosetta





BOOK the Second.

Of BIRDS.

Fig. 1.



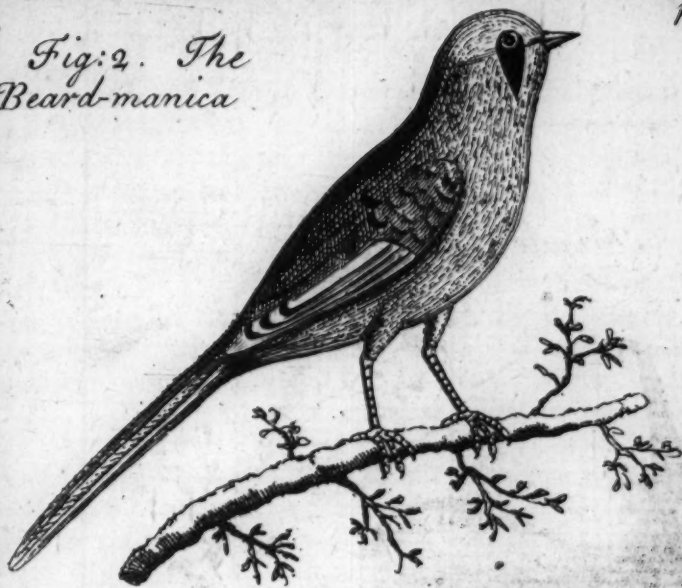
THE AVOSETTA, is a Bird common at *Rome* and *Venice*, and do also frequent our Eastern Coasts of *Suffolk* and *Norfolk* in Winter time.

Its length from the tip of the Bill to the end of the Tail, was fourteen Inches; breadth, when the Wings were expanded, twenty one Inches; its weight nine Ounces: Its Bill was three Inches long, slender, black; flat or depressed, reflected upwards, which is peculiar to this Bird, ending in a very thin, slender, weak point; the Tongue is short, not cloven; the Head of a mean size, round like a Ball, and black above the Eyes; the Colour of the whole under Side of the Body was white, and the upper side partly white and partly black, or dark brown; its Legs are very long, of a lovely blue Colour, bare above the Knees, and the Claws black and little; it hath a back Toe, but a very small one. Mr. *Albin* says, he had this Bird from *Newgate-Market*; it was brought to that Place with other Wild-fowl.

Fig. 2. The BEARD-MANICA, or BEARDED-TITMOUSE, is in length from the tip of the Bill, to the end of the Tail, about six Inches and an half; in breadth, when the Wings are extended, ten Inches and a half; in weight nine Drams and a half: The Bill is short, thick, and of a yellowish Colour, (in the Hen dusky.) The Head is of a dark ash Colour; from the Eyes a Tuft of black Feathers hangs down, ending in a point, representing a picked Beard, from which Mark it has the Name of *Beard-manica*. The Back, upper part of the Wings, and lower part of the Belly, and Tail, are brown; under the Chin white; the Breast, Belly, and Thighs, of a pale yellowish white, with a tincture of brown; the Legs and Feet black. This Bird is very singular in the care and love which he shews to the Hen; when at Roost, he covers her all Night with his Wing. The Hen is something smaller than the Cock, and of a more beautiful yellowish brown; the Wings and Legs of the same Colour with those of the Cock: The Hen is without the Beard, and more pale on the Breast.—They are found in the Salt-Marshes in *Essex*, and likewise in the Fens in *Lincolnshire*.

Fig. 3. The JACOBINE-PIGEON, or as it is vulgarly call'd for shortness, the JACK, is, if true, the smallest of all Pigeons, and the smaller still the better: It has a range of Feathers inverted quite over the hinder part of the Head, and reaching down on each side of the Neck to the Shoulders of the Wings, which forms a kind of a Fryar's Hood: From hence this Pigeon has its name *Jacobine*, because the Fathers of that Order all wear Hoods to cover their bald crowns; hence the upper part of this range of Feathers is call'd the Hood: and the more compact these Feathers are, and the closer to the Head, so much the more this Bird is esteem'd. The lower part of this range of Feathers is call'd by us, the *Chain*, but the *Dutch* calls it the *Cravat*; the Feathers of this Chain ought to be long and close, so that if you strain the Neck a little, by taking hold of the Bill, the two sides will lap over each other in some of the best; but there are very few
now

*Fig: 2. The
Beard-manica*



*Fig: 3 The
Jacobine Pigeon*



Fig. 4.
Frigate Bird



now to be found in *England* compleat. The *Jacobine* ought to have a very short Bill, the shorter the better, and a clean Pearl Eye. As for their Colour, there are reds, yellows, blues, blacks, and mottles; but be the Colour of the Feathers what they will, they ought to have a clean white Head, white Feet, and white Tail. Of these Pigeons, some are feather-legg'd and footed, others are not, and both sorts are equally esteem'd, according to the various Inclination of different Fancies.

Fig. 4. The FRIGAT Bird, which the *Indians* call so, because of the swiftness of its flight; has a Body no bigger than a Pullet's, but its Stomach is very fleshy: The Males are as black as Ravens. The Neck is pretty long, the Head small, with two great black Eyes, and the Sight more piercing than the Eagle's; The Bill is likewise pretty thick, and entirely black, about six or seven Inches long; the upper Beak is crook'd like a Hook: The Claws are very short, and divided as the Vulture's. The Wings of this Bird are very large, and not without a provident design of Nature, since his Wings are sometimes employ'd to carry him above a hundred Leagues from Land. It is with a great deal of Trouble, that this Bird can raise himself upon the Branches, because of the extraordinary length of his Wings; but when he has once taken his flight, he keeps his Wings extended almost without any Motion or Fatigue. If sometimes the weight of the Rain, or the violence of the Winds, force him, he mounts above the Clouds, beyond Sight, in the middle Region of the Air; and when he is at the highest, he does not forget where about he is, but remembers the place where the *Dorado*, or gold Fish, gives chase to the flying Fish, and then he throws himself down like Lightning; not so as to strike upon the Water, for then it would be difficult for him to rise again; but when he comes within twelve or fourteen Fathoms, he makes a large turn, and lowering himself, as it were insensibly, till he comes to skim the Waters where the Chase is given; in passing, he takes up the little Fish, either with his Bill, or his Talons, and sometimes both together.

gether. He has a great red Comb, like that of the Cock, not upon his Head, but under the Throat; and this Comb does not appear but in the old ones; The Females have none; the Feathers are whiter than those of the Males, especially under the Belly. These Birds, for a long time, made a little Island their Habitation; in like manner, as the Rooks have a Rookery, where all of that Species thereabout, come to roost at Nights, and build their Nest in the proper Season. This little Island was called the *Isle of Frigats*; and bears the Name to this Day, tho' the Birds have left the Place; for in the Year 1643, and the following Year, several People chas'd them so severely, that they were forc'd to forsake the Isle. Father *du Tertre*, Apostolical Missionary in the *Antilles*, mov'd by the large Commendations give of the Oil drawn from these Fowls, with the Assistance of two or three more Persons, took above one hundred of them in less than two hours time. They surpriz'd the old ones upon the Branches of the Trees, or in the Nests; and as they rise with a great deal of Difficulty to take Wing, it was an easy matter to beat them down with long Sticks. The Oil, or Fat of these Birds, is a sovereign Remedy for *Sciatica* Pains; and for all others proceeding from a cold Cause: It is held in great esteem throughout all the *Indies*, as a precious Medicine.

Fig. 5. The BENGAL JAY is something bigger than our *English Jay*: The Bill is of an ash Colour; the top of the Head blue; the Neck and Breast an ash, with a mixture of light brown and red; the Wings are blue, as also the under part of the Belly and Thighs; the Back and Rump are of a muddy green Colour; the Tail is of a dark blue next the Body, of a pale or bright blue in the middle, and dark towards the end: Its Legs and Feet are of a yellowish brown; and the Claws black.

Fig. 6. The BENGAL QUAIL is something bigger than our Quail: Its Bill is of a dark ash, inclining to brown; the top of the Head is black, and under that a bed of yellow; then a line or bar of black crossing from the corners of the Mouth, and encom-

passing

Fig. 5
A Bengal Jay



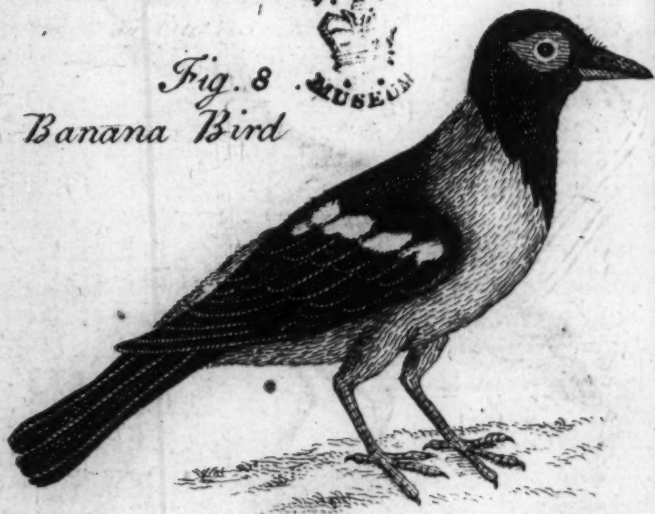
Fig. 6
Bengal Quail



Fig. 7.
Bohemian-Jay



Fig. 8.
Banana Bird



passing the under part of the Eye, and round the back part of the Head; and under that a Bed of white; the Breast, Belly, and Thighs, are of a pale yellowish buff Colour; the under part next the Tail spotted with red: The hind part of the Neck, Back, and covert Feathers of the Wings, are of a yellowish green, excepting a large Mark of a pale bluish green, on the Pinion of the Wings, and another of the same colour on the Rump: The Legs and Feet are of an orange Colour; the Claws of a dark muddy red.

Fig. 7. The BOHEMIAN JAY, or CHATTER-ER, is as big as a Blackbird; being in length, from the point of the Bill to the end of the Tail, nine Inches; breadth, when the Wings are extended, eighteen Inches; its Bill is of a greenish Colour; the Eyes of a beautiful red encompassed with black; the Head somewhat flatish, and of a chesnut Colour, adorned with a Crest or Tuft bending backward, of the same Colour, the top more faint: The upper part of the Neck, Back, and covert Feathers of the Wings of an amber Colour; the Breast, Belly, and Thighs more dilute; the Quill Feathers of the Wings are of a dark ash, inclining to black, the half of which have their Tips yellow; the Tail blackish, except the Tip which is yellow. This Bird is said to be peculiar to *Bohemia*: It feeds on Fruit, especially Grapes, which it seems very greedy of. It is exceedingly voracious; flies in Companies, and is easily tamed.

Fig. 8. The BANANA Bird from *Jamaica*, is of the bigness of our *English* Sterling: The Head, Neck, and upper part of the Breast, part of the Back, and the Wings and Tail were black, except some white Spots in the upper covert Feathers of the Wing; all the rest of the Body is of a fine gold yellow. It resembles the Sterling in all its Actions, being very mischievous. It is a Native of *Jamaica*, and other of the *Caribbee* Islands. Four or five of these Birds, will set upon, and kill a large Bird or Fowl; and when dead, each one, according to his place of Masterhip, choose

choose his part, viz. the Heart, Brains, &c. keeping the part which he makes choice of, till he has satiated himself. This, says Mr. *Albin*, I have been Eye-witness too.

Fig. 9. The *WARWOVVEN* is almost as big as an Eagle; the top of his Head and Neck, were of a flesh Colour, bare of Feathers; the sides of the Face, Chin, and back part of the Head, of a dark brown Colour; the Bill long, and hooked at the end, of a red or saffron Colour, with a broad stripe of lead Colour in the middle, round the upper and under Mandible; on the base of its Bill, grew two broad flat scalloped Caruncles of an orange Colour: The Irides of the Eyes white, circled round with scarlet: The Ruff was thick set, with soft long downy Feathers, of an ash Colour; the Back and covert Feathers of the Wings, were of a pale buff Colour; the Quill Feathers black; the Claw was of a flesh Colour, and bare of Feathers, hanging down like a Bag on the Breast; The Breast, Belly, and Thighs were white; the Tail was composed of twelve white Feathers, tipped almost half way with black. The Legs and Feet were of a yellowish flesh Colour; the Claws black; its Food was raw Flesh. This Bird I saw at the *George Tavern at Charing-Cross*, with the *Cassowaries*; his Keepers call'd him the King of the *Vavows*, or King of the Vultures. He was brought by a *Dutch Ship* from *Pallampank* in the *East-Indies*. It seems to be somewhat like that Bird which Mr. *Willoughby* describes by the Name of *Uruba*, or the *Brasil Vulture*.

Fig. 9
The Warrwoven



Fig. 11.

The Little Owl



Fig. 10.

Little Horn Owl



Fig. 10. The Little HORN-OWL is in weight about ten Ounces; its length from the point of the Bill to the end of the Tail, fourteen Inches; its breadth, when the Wings are extended, three Feet four Inches; its Bill black, and a little above an Inch long; the Tongue fleshy and a little divided; the Face is encompassed with a double row of Feathers, the outer row variegated with small white, black, and red Lines; the inner row, under the Eyes, reddish. Its Horns were above an Inch long, of a yellowish white, with six indented transverse Lines of black; and in shape resembling the Ears of a Cat. The whole Bird was cover'd with a delicate Plume, beautifully variegated with white, black, red, yellow and brown Colours. The Legs of this Owl were feather'd down to the Feet, and of a light brown Colour; the Claws black. These Birds are found in mountainous and unfrequented Places, not delighting in the lower and plain Countries. That from whence this Figure was copied, was shot on *Enfield Chase*: in the Stomach of it was found Bones and Fur of Mice.

Fig. 11. Is call'd the LITTLE OWL: It was taken on the Coast of *Ushant* by my Brother; it having lost its way at Sea, lighting on the Mast of the Ship, was so tired that it suffer'd itself to be taken without any Resistance, and was preserved and brought home by him, and given to me; and from that Bird this Figure was taken by Mr. *Albin*. This little Owl was about the bigness of a Blackbird; it weighed three Ounces; its length from the tip of the Beak to the end of the Tail, was seven Inches and a half; breadth when the Wings were extended, fourteen Inches: Its Bill was like that of other Owls; the Tongue a little divided, as in the rest of this Tribe; the Ears great,

C

the

the Eyes lesser than in other Owls. The Wreath or Circle of Feathers encompassing the Face, beyond the Ears less and less discernable; the upper part of the Body was of a dark brown, with a Mixture of red, having transverse white Spots, intermixed with lines and small specks of black; the Feathers about the Ears were more variegated with black and white; the Chin and Belly of a yellowish white; the Breast marked with long dusky Spots, inclosed with a border of white; its Wings were prettily chequer'd with black and white: Its Legs feather'd down to the Claws; the Feet of a dark yellow; the Claws blackish: It had two fore Toes, and two back Toes.

Fig. 12. The HOOPOE COCK is in weight about ten Ounces; in length, from the tip of the Bill to the end of the Tail, twelve Inches; breadth, when the Wings are extended, eighteen Inches; its Bill two Inches and a quarter long, black, sharp, and something bending. The shape of the Body approacheth to that of a Plover: The Head is adorned with a most beautiful Crest two Inches high, consisting of a double row of Feathers, reaching from the Bill to the Nape of the Neck, all along the top of the Head; which it can at pleasure set up and let fall; it is made up of twenty-four Feathers, some of which are longer than others; the tips of them are black, under the black they are white, the remaining part under the white being of a chesnut inclining to yellow; the Neck is of a pale reddish yellow; the Breast white.

Fig. 13. The HOOPOE HEN frequented a Garden at *Woodford on Epping Forest*, where they had observed it some time, and used all the means to take it they could; but it was so shy, that it avoided all their

Fig. 13.
Hoopoe Hen



Fig. 12.
Hoopoe Cock



Fig: 14
The Flammant



their Traps that were laid for it; which the Gentleman observing, order'd it to be shot; which was accordingly done, and sent to Mr. *Albin* to draw the Figure of it. A Cock Bird of this kind was shot near *Winchester* in *Hampshire*. These Birds are not very common in *England*; but about *Cologn*, and elsewhere in *Higb Germany* are frequent, where they call them *Widebuppe*: They sit for the most part on the Ground, sometimes on Willows, &c. They feed like *Woodpeckers*, on Beetles and other Insects.

Fig. 14. The FLAMMANT was in length, from the tip of the Bill to the end of the Claws, four Feet ten Inches and a half; in breadth, when the Wings were extended, four Feet; the Legs sixteen Inches from the Knee to the end of the middle Claw; its Bill five Inches and a quarter long, of a singular shape; the upper Mandible is flat and broad, crooked and toothed; the lower thicker than the upper; the tip black, in the young Birds of a dark blue. It is two Years before this Bird arrives to its perfect Colour; at which time it is entirely red, except the prime Feathers of the Wings, which are black when it is at its full bigness: its weight is about two Pounds and a half; its Legs are long, and of a red Colour, bare of Feathers a good way above the Knees; the Toes webb'd together; the Claws black. These Birds make their Nests on Hillocks, in shallow Water, on which they sit with their Legs extended downwards. They breed on the Coast of *Cuba* and the *Babama* Islands, and frequent the salt Water; a Man by concealing himself from their sight, may kill great Numbers of them, for they will not rise at the Report of a Gun; neither is the sight of those killed close by them, sufficient to terrify the rest, and warn them of

the Danger; but they stand gazing, and as it were astonished, till they are most or all of them killed. When they feed (which is always in shallow Water) by bending their Neck, they lay the upper part of their Bill next the Ground, their Feet being in continual Motion up and down in the Mud; by which they raise a small round sort of Seed or Grain, resembling Millet, which they receive into their Bill; and as there is a necessity of admitting into their Mouths some Mud, Nature has provided the edges of their Bill with fine Teeth like those of a Comb, with which they retain the Food, and reject the Mud that is taken in with it. They are thought by some to feed on Fish likewise. This Figure was taken from the Bird itself by Mr. *Albin*: It was brought from Sir *Robert Walpole's*, where it had been kept alive in the Kitchen some time.

Fig. 15. The CARASOW COCK is almost as big as a Turkey; its Bill thick, and hooked at the end, partly ash and partly yellow; on the Base of the upper Mandible is a round Excrecence of the bigness of a Nutmeg, of a yellow Colour; the Eyes black; the Head and Neck covered with Feathers of a deep black like Velvet: On its Head is a Crest of curled black Feathers with white tips turning up spirally as far as the beginning of the Neck, which it can erect or let fall at pleasure: All the rest of the Bird is black, excepting the lower part of the Belly about the Vent, which is white, with a Mark of the same Colour across the Thigh; the Legs and Feet are of a pale rusty Colour.

Fig. 16. The CARASOW HEN is no less beautiful than the Cock; her Head and Neck were black; the tips of some of the Neck-feathers white, with a broad Stripe of white across the middle of the Crest; the Bill was of an ash Colour; the Excrecence on the Base as in the Cock, yellow: The Breast and lower part of the Neck, Back, and Wings were of a dusky brown, the middle of the Belly white; the tips of some of the Feathers black; the Thighs and Parts about the Vent, of a pale yellowish brown; the Tail
black,

Fig: 15.

Carason Cock



Fig: 16.

Carason Hen



*Fig: 17.
The Red Bird.*



Fig: 18.

Ganfer



black, with four Bars of white at equal Distances across it; the Legs and Feet of an ash Colour. These Birds, like other domestick Fowl, are tame and sociable, eating and drinking with any Company. The Cock of this Fowl came from the *West Indies*: They are generally brought from *Carasow*, from whence they take their Name. They are called by the *Indians*, *Tecuecholi*, Mountain-Bird, or *American Pheasant*.

Fig. 17. The RED BIRD from *Richmond*. This Name is imposed on it, for want of knowing its real Name. It was kept at *Richmond Palace*, when Her present Majesty was Princess of *Wales*, amongst her Collection of Rarities of this kind. Mr. *Albin* drew the Figure from the Bird itself, but could not meet with any one to inform him from what Country it was brought, nor to answer some other Questions he wanted to ask concerning it. Excepting in the Colour, it is pretty much like the *Carasow* Hen, and about the same bigness; its Head likewise is furnish'd with a beautiful Crest, very much resembling the Crest of that Bird; and indeed it seems to be of the same Species with that Fowl: The Disagreement that is between them, may perhaps be only owing to the different Places they are brought from, or such Difference as is common amongst tame Fowls. The outer edges all round the Crest was black; the lower part of the Crest next the Head, and part of the Neck, was of a lead Colour; all the rest of the Bird, a fine red, only the Wings and Tail somewhat darker than the Body; and the Legs and Feet black.

Fig. 18. The GANSEER may be classed with those of the Goose-kind, the Bill and Feet being like theirs; the top and back part of the Head, Breast, Belly, and Thighs were of a pale yellowish buff-colour, with a light tincture of reddish brown, here and there in Spots, excepting a large Spot of reddish brown on the middle of the Breast: The Bill was red, flat, and toothed like that of the Goose: The fore-part of the Head round the Eyes reddish brown, with a ring of the same Colour round the upper part of the Neck,

C 3

joining

joining to the Head: The back part of the Head and Back were of a reddish brown Colour: The Tail short and black. It was web-footed, its Legs very long, and bare above Knee, both Legs and Feet of a red Colour. Its Food was the same with that of Geese, eating Grass and Corn. The Difference between the Cock and Hen could not be distinguished, either by the Colours or Shape, but only by the Cock's running to the Hen with open Wings, clasping or embracing her round with them.

Fig. 19. The RED-WING'D STARLING very much resembles the common Starling in shape and size. The whole Bird is black, except the upper part of the Wings, which is a bright scarlet, under that a yellow: The Legs, Feet and Claws are black. This Bird was shot near *London*; it was thought to be a Cage Bird, which had got loose: In its Gizzard was found Grubs, Beetles, and small Maggots. It is a Native of *Carolina* and *Virginia*, in which Countries they are very numerous. Mr. *Catesby* makes mention of its flying in Companies with the Purple-Daws, and destroying the Corn wherever they come, being the most destructive Birds in those Countries. He says it makes its Nest over the Water amongst Reeds and Sedges, the tops of which they interweave so artfully, making an Arch or Covering, under which they hang their Nest, (after the manner of the Reed Sparrow) and so secure from wet, that where the Tide flows it is observed never to reach them. It is a very active and familiar Bird, and when kept in a Cage will learn to imitate human Speech.

Fig. 20. The RED-LEGG'D HORSEMAN is in length from the point of the Bill to the end of the Claws, sixteen Inches; in breadth, when the Wings were expanded, twenty four Inches; in weight eight Ounces; its Bill about two Inches long, and slender, reddish at the Base, and black at the Point. The top of the Head, and upper part of the Neck are of a light brown; the Feathers of the Back, and covert Feathers of the Wings in the middle black, then brown edged

Fig: 19
Redring'd Starling



Fig: 20 Red Legg'd
Horsman



Fig. 22.
Long Tail'd
Humming Bird



Fig. 21. Green
Crown Bird



edged with white, which continues down to within an Inch and a half of the Tail. The Legs are long, and of a pale reddish orange colour, bare above the Knee; the fore Toes long; the Claws small and black. This Bird was shot on the sandy Bank of a River in *Essex*. The Hen is much of the same Colour of the Cock, the Legs excepted, which are of a green Colour.

Fig. 21. The GREEN CROWN BIRD is a very stately fine Fowl, of the bigness of a large Turkey. Its Body is cover'd with long Feathers resembling Hair; and of a dark green Colour, having a purplish cast on the Back and Sides, some broad Stripes of red on the Wings tending downwards, the Thighs of a yellowish buff-colour; the Legs and Toes long, of a pale yellow Colour; the Claws black. Upon the top of the Head of this Bird, grew certain shafts or stalks, bearing little round Balls on their tops, like those of an Earl's Coronet, of a yellowish Colour: On the fore-part of the Head, a little above the Bill, it has a small red Comb, and two red Marks on each side of the Head. The Bill is short, thick, strong, a little bowed; and of a pale yellow Colour. This Bird is found in the *East Indies*.

Fig. 22. The LONG-TAIL HUMMING-BIRD is the least of all the Species of this Kind of Birds, of which Naturalists reckon nine different sorts, and the least that we know of found upon our Globe. Its length from the beginning of the Head, or Insertion of the Bill, to the rise of the Tail, is two Inches and a half; that is, the Neck one Inch, and the Body an Inch and a half long: the Head small; the Bill a little more than an Inch long, black, round, sharp and almost straight. The Legs and Feet like those of the rest; the Feathers also of the Body and Wings are alike disposed, but differently coloured: It hath a Tail longer than any of the rest, somewhat more than three Inches, consisting of Feathers, of which that which is nearer to its rise is shorter, the second always longer. The Tail is forked, and the Bird in flying spreads it
into

into two large Horns, so that the tips of the Horns are an Inch and an half distant from each other. The whole Head and Neck of this Bird is of a shining filken black Colour, inclining to or interchanging with blue, as in the Necks of Mallards; the whole Back and Breast are green, shining interchangeably with golden and sea-green, as in the second kind of these Birds. The Wings are of a liver-colour; the Tail of of a blackish blue, shining like polished Steel blued over. There are so great a variety of beautiful Colours, in the Feathers of all the Kinds of these Birds; and so wonderfully resplendent, that they cannot be well represented by any Painter: The *Indians* make of these Feathers the Representations of Saints, and other things; so dextrously and artificially, to the Life, that one would think they were drawn with a Pencil in Colours. These Birds are fed and nourished with Honey, Dew, and the Juice of Flowers, which they suck out of them with their Bill, or rather very long Tongue, provided and fitted by Nature for that Use; so that being taken alive, they cannot be kept for want of Food, but die in a short time.

Fig. 23. The PORPHYRIO is a kind of Water-Hen; its Body is all over of a purple blue Colour; the Tail of a whitish ash Colour: Its Bill, Legs and Feet, red. *Pliny* says, that when it drinketh, it seemeth to bite the Water; and hath this Property by himself, to dip and wet his Meat now and then in Water, and then with its Foot instead of a Hand, to reach it to its Bill. The best of this Kind, he says, are in *Comagene*. Mr. *Willughby* (in his *Ornithology*) says, neither *Gesner*, nor *Aldrovandus*, nor himself, had ever seen this Bird, but Pictures of it only; and seeing that the Pictures of it do much vary, and none of those who have compiled Histories of Animals, do profess themselves to have seen the *Porphyrio*; we did (says he) sometimes doubt, whether there were any such Bird in Nature; especially seeing some of those Things which the Antients attribute to it, as (for Example) that it hath five Toes on each Foot, are without doubt false and fabulous. But because all the Pictures

Fig: 23.
Porphyrio





Fig. 25.

Crown Bird



tures of it do agree in the figure of its Bill, Legs, Feet, and some other Parts, we have now changed our Minds, and are more apt to believe the Affirmative, *viz.* that there is such a Bird as they picture. Let others (says he) who have the hap to see it, describe it more exactly, and so remove all Doubt and Scruple concerning this Matter out of the Minds of the Learned and Curious. This Figure I here exhibit was copied from a curious Drawing, belonging to a Noble Person, whose Name I am forbid to mention.

Fig. 24. The AMADAVAD BIRD in bigness scarce exceeds the *Golden-crown'd Wren*. Its Bill in shape is like a *Goldfinch's*; for colour red: The upper side of the Body is of a dusky Colour, in some Birds lighter, in others darker; only the Feathers growing about the Rump are of a scarlet or deep orange; the Quill-feathers of the Wings and those of the Tail are black. The Tail itself is an Inch and half long, made up of twelve Feathers. In some Birds the upper part of the Breast is of a scarlet red, in others it is wholly black, as is the rest of the Breast and Belly in all. The Colour of the Feathers of these Birds vary very much: The Legs and Feet are white; the Claws very long, like those of Larks, but more crooked. These *Amadavad* Birds are brought from the *East Indies*.

Fig. 25. The CROWN BIRD from *Mexico* is of the bigness of the *Thrush*; its Bill of a tawny Flesh-colour, thick and short, after the manner of the Grosbeaks.

beaks. It has a large Crest of green Feathers, which it can set up or lay down at pleasure: The Head, Neck, Back, Breast, and part of the Belly, green; the lower part of the Belly and Thighs of a dusky brown Colour; the first four Quill-feathers of the Wings scarlet, the fourth having fine long white Marks in the outer Web; the rest of the Quill-feathers purple, as was also the Tail; the covert and scapular Feathers of the Wings purple, with a Mixture of green; the Legs and Feet of a bluish lead Colour.

Fig. 26. The MANUCODIATA, or *Bird of Paradise*, for bigness and shape of Body, comes near to a Swallow: The Feathers investing it are of several Colours, very beautiful and lovely to behold: The Head like that of a Swallow, and large for the smallness of the Body; the Bill somewhat longer than that of a Swallow. No less than ten sorts of *Birds of Paradise* are described by Naturalists; which differ in size, figure, or colour, from each other. There has been divers Stories delivered by antient Authors concerning these Birds, that in former Ages were generally received and accepted for true, even by Men of Learning, which are now discovered to be Fables, and rejected and exploded by all Men: Such as their wanting Feet and Legs; that they lived upon Celestial Dew; that they flew perpetually without any intermission, and took no rest but on high in the Air, their Wings being spread; that they were never taken alive, but only when they fell down dead upon the Ground, &c. These most beautiful Birds (as *Aldrovandus* reports) are called by the Inhabitants of the *Molucca* Islands, *Manucodiatæ*, that is, *God's Birds*; and

Fig: 26.
of Paradise

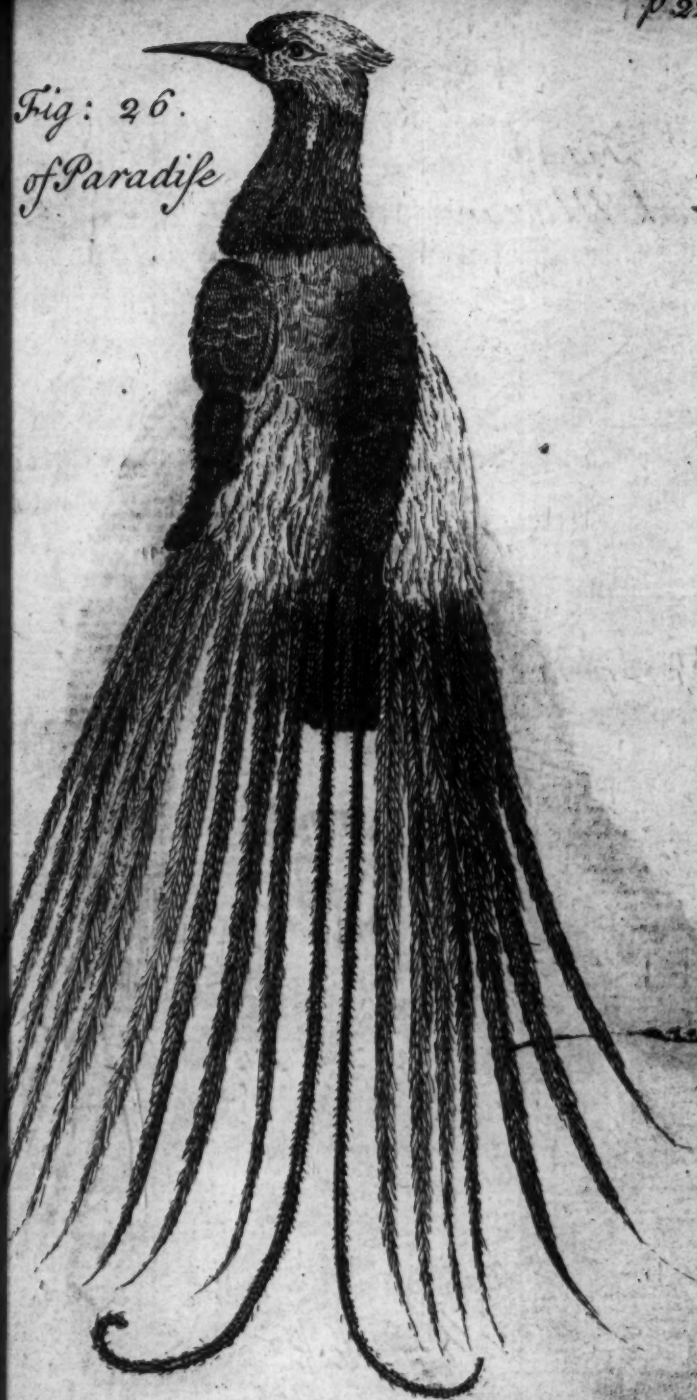


Fig. 27.
Cock Maccan



an
ca
an
th
be
are
ga
dif
an
wi
ent
the
Fee
nor
arm
Bir
Ind

F
Nec
a fi
ther
and
Beak
tipt
all

and had in great Esteem and Veneration. They are call'd *Birds of Paradise*, both for the excellent shape and beauty of their Bodies, and also because where they are bred, whence they come, and whither they betake themselves, is altogether unknown, since they are found only dead upon the Earth; so that the Vulgar imagine them to drop out of Heaven, or Paradise. All which things are now sufficiently refuted, and proved to be false and fabulous, both by Eyewitnesses, and by the Birds themselves brought over entire. As for that particular of their wanting Legs, these Birds are now well known to have Legs and Feet as well as others; and those not short, small, nor feeble ones, but sufficiently great and strong, and arm'd with crooked Talons, as being the Members of Birds of Prey. They are brought from the *East Indies*.

Fig. 27. The COCK MACCAW: Its Head, Neck, Breast, Belly, and under part of the Tail are a fine scarlet, as is also some of the covert Feathers of the Wings; the Back, rest of the Wings, and upper part of the Tail, are of a rich blue: The Beak is of a light ash Colour, the upper Mandible tipped with black: The Legs and Feet are of a dark ash Colour.

Fig. 28. The HEN MACCAW from *Jamaica*, and other Parts of the *West Indies*: is in length from the tip of its Bill to the end of the Tail, thirty Inches: The Body equals that of a well-fed Capon: The Bill hooked, and in that measure that it makes an exact Semicircle, a full Palm long. The top of the Head, the Neck, Back, Wings, and upper side of the Tail, of a very pleasant blue or azure Colour: The Throat, Breast, Belly, Thighs, Rump and Tail underneath all of a saffron Colour. The Tail was about eighteen Inches long: The Legs very short, thick, and of a dusky or dark Colour; as are also the Feet; the Toes long, armed with great, crooked, black Talons. It differs from the Cock, which is of a beautiful scarlet and blue Colour. These *Maccaws* are the largest of all the Parrot Kind, and bear a good Price, being commonly sold for ten Guineas. This Bird seems to be the same with that *Aldrovandus* calls the greatest *blue and yellow Maccaw*: and likewise the *Maccaw* call'd *Ararauna* by the *Brazilians*; described by *Marggravius*.

Fig. 28.

n: Maccan



Fig: 29.
Yellow Sawrey



Fig
Green Paroque

is
of
C
In
un
are
low
wh
mi
gr
ha
low
pr
ca
Bi
TH
&c
TH
in
wh
nou

top
wif
Ru
of
yell

Fig. 29. The yellow LAWREY, or PAROQUEET, is of the bigness of a Lark, hath a very hooked Bill, of a grey Colour: Its Legs and Feet are of an ash Colour: It hath a very long Tail, reaching about ten Inches beyond the ends of the Wings; both the Belly underneath, and also the Head, Neck, and Back above, are of a beautiful reddish Colour: but the Breast and lower Feathers of the Tail are of a pale rose Colour, which Tail-feathers end in a lovely blue, or Colour mingled of white and green. The Wings are chiefly green, but interwoven with red Feathers, the one half whereof is so variegated on each side with yellow and rose Colour, that exposed to the Sun it represents a thousand varieties of shining Colours, and can hardly be expressed by a Painter: so that this Bird deserves to be highly prized by great Persons. These Paroqueets are brought from the *East Indies*, &c. and are found chiefly in the midland Countries: They roost and build on the highest Trees; they fly in Companies, and with great noise, as doth the whole Tribe of Parrots: They also learn to pronounce some Words, if they be kept tame.

Fig. 30. Is the small GREEN PAROQUEET; the top of the Head and the Throat are red; as is likewise part of the Tail; the Pinions of the Wings and Rump bluish, all the rest of the Feathers of this Bird of a deep green: The Bill hooked, and of a pale yellowish Colour.

Fig. 31. The GREEN PARROT is on the top and sides of the Head, and Rump, of a fine yellow, or gold Colour, intermixed with red: The Shoulders of the Wings a fine scarlet; the first, second, and third rows of covert Feathers of the Wings, are of a beautiful green; the large Quill-feathers of a deep blue, with white edges: The outer edges of four Feathers in the Tail, the same Colour with those on the Shoulders of the Wings.

Fig. 32. The LAWREY is the most beautiful Bird of all the Parrot Kind: The top of its Head is of a fine purple; the Wings of a curious green, as is also the Thighs: It has a half Circle of bright yellow under the Throat: The Neck, Back, Belly and Tail, are of a lovely scarlet: The Legs of a lead Colour; and the tip of the Tail black. The *Lawrey* is as big as the large common Parrot.

Fig. 31. Green Parrot*Fig. 32. The Lanvrey*

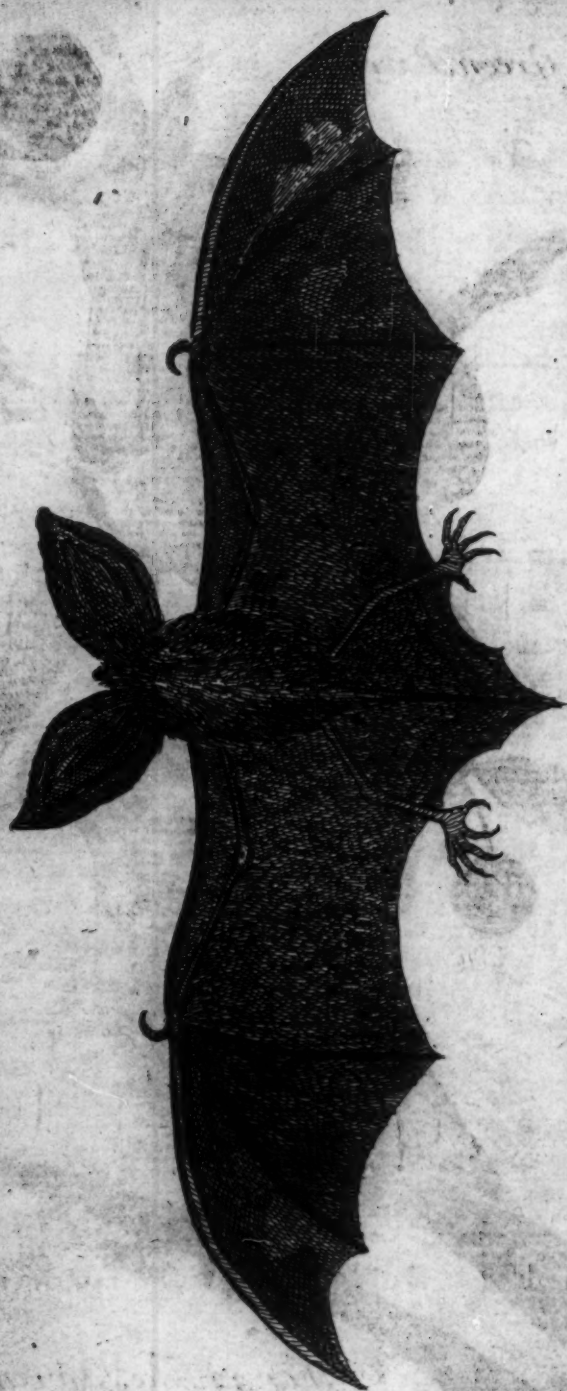


Fig: 33. The Batt-

Fig. 33. The BATT, or FLUTTER-MOUSE, is a Creature between a Bird and a Beast, of which there are three Kinds that we know of, viz. the common sort, frequent in *England*; another sort about one fourth bigger than the common, with Ears twisted like *Rams* Horns, about an Inch and a half in measure; and a third kind brought to us from the *West Indies*, whose Body is as large as a Rat, and the Wings being extended, measure from point to point above two Feet. In these Creatures there is no remarkable difference, but the size of their Parts. These Animals partake of the four-footed Kind in the Make of the Head, which agrees very much with those of the Mouse or Rat kind; the shape of the Trunk of their Bodies likewise is much the same, and are both cover'd with Hair: They also bring forth their young ones perfectly formed, like the four-footed kind, and give them suck. They partake of the Bird kind in having only two Legs, besides the Hooks at the pinions of their Wings; they have also the Power of flying. The Note or Voice of these Animals is between the chirping of Birds, and the cry of four-footed Beasts. These Creatures have not long Tails, like Animals with four Feet. It is said, the *Batt* sleeps all the Winter in Holes of old Houses and Walls; it very rarely appears in the Day-time, but flies in the dusk of the Evening only. The Wings of a *Batt* are wonderful strange, consisting of one entire Skin, webb'd together somewhat like the Feet of Water-Fowl. The Claws or Hooks on the tops of the Wings, this Creature makes use of to hang by to any thing it is minded; whilst it is either feeding, sleeping, &c. It feeds on Bacon, Cheese, &c. The Description of this Creature would more properly have come in between the *Beasts* and *Birds*; but being omitted there, I chose to place it here rather than leave it out.



BOOK the Third.

Of FISHES.

Fig. 1.



THE CUTTLE-FISH is a Sea-fish, of a very odd shape: The Covering of the Back is a sort of Shell, Scale, or Bone, as thick as a Man's Hand, an Inch thick in the middle, but thinner on the sides, light, hard without and spongy within, very white, and something of a saltish taste: The Body of this Fish is white: The Head, Feet, &c. red, blue and white intermixed. It has two large black Eyes, encircled with red: two Trunks or kind of Arms, fixed to the Head, which serve it for swimming, and to catch its Prey: Besides these it has six Feet that have Teeth on their upper part, and two much larger underneath, which shoot out from the Head like Horns: It lives on small Fish that it catches after the manner of Angling, by letting down its two Arms or Feelers as it were a Line, with a Crook at the end of it. 'Tis accounted good Meat, and brought to the Table in several Parts of France: They are best when large, chiefly in the Months of *January, February, and March*; for the most part they



Fig: 1 Cuttle Fish



Fig: 2. The Croker .

they are boiled, and eat better than roasted: In *Illyria* the greater are salted, and from thence carried to *Venice*. The *Cuttle-Fish* carries under its Throat a Bladder, or Receptacle, full of an Humour blacker than Ink, which it discharges into the Sea when in danger, to intercept the Sight of the Pursuer, and thereby maketh its escape. They generate by Embraces, in the Spring, and go (as they say) fifteen Days: their Eggs are first white, till they put forth their black Liquor thereon: The Young are excluded the Egg as Birds: The Male is known as being rougher, and is said to assist the Female when in danger. The Powder that is made of the inside of the Shell of this Fish is highly esteemed in Medicine, and by some Persons preferred to that of Pearl.

Fig. 2. The *CROKER* is usually about fourteen Inches in length, of the size of a large Mackrel, but thicker: In deeper Waters, as in the great Bay of *Chesapeake* they are sometimes taken three Feet in length: The Back and upper part of the Head of this Fish are of a brown Colour; the Sides and Belly of a light Colour, tingured with red; the Tail entirely red: It has six Fins, two on the Back, two on the Belly, and one on each side below the Gills; the Fins are of a light Colour, striped with a faint red: The Iris of its Eyes are of a fine gold Colour; the Mouth large, furnish'd with very small sharp Teeth. These Fish are found in most of the Rivers of *Virginia*. They are accounted tolerable good Meat.

Fig. 3. The **BONE FISH** is on the upper part of the Head, Back, and Tail, of a dusky blue Colour; the Belly and Sides of a light ash Colour; the Eyes encircled with white; the Tail forked: It has four Fins; a long spiny one on the Back, one on the Belly, and one on each side under the Gills, near the upper part of the Belly. There are plenty of these Fish on the Coasts of the *Bahama Islands*.

Fig. 4. The **ISING-GLASS FISH** is twenty-four Foot long, and weighs four Hundred weight. It is usually met with in the Seas about *Muscovy*, in *Hungary*, and other Parts of the *Danube*. The Back of this Fish is so well furnish'd with Prickles, which stand up like the Teeth of a Saw, that there is not any Fish, how strong soever, will dare to bite it; and the Scales, though they are small, are very sharp, as represented in the Cut, which answers to the Original taken from the Fish itself. The Head of this Fish is very thick, heavy and large, the Mouth very long and open; from the Jaw hangs down two fleshy Barbels. Some have thought from the Nature and Bulk of this Fish, that it is of the Whale-Kind. They make the *Ising-glass* by cutting all the Parts of the Fish in pieces, which they steep in hot Water, and then let it boil over a gentle Fire, till it is dissolv'd and reduc'd into a Jelly. They spread this upon Instruments made for the Purpose, that it may dry, and be made into a kind of Parchment. When it is almost dry, they usually roll it up into Wreaths of different shapes and sizes.

The

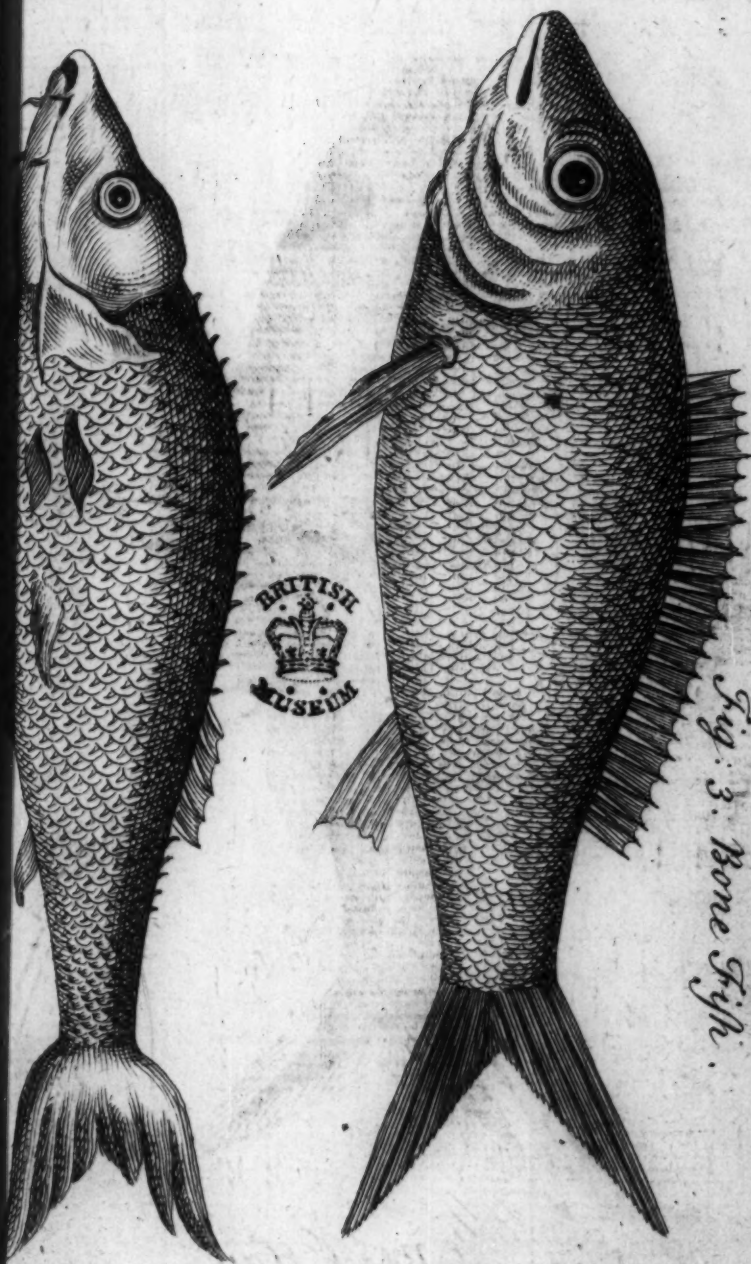


Fig. 3. Bone Fish.

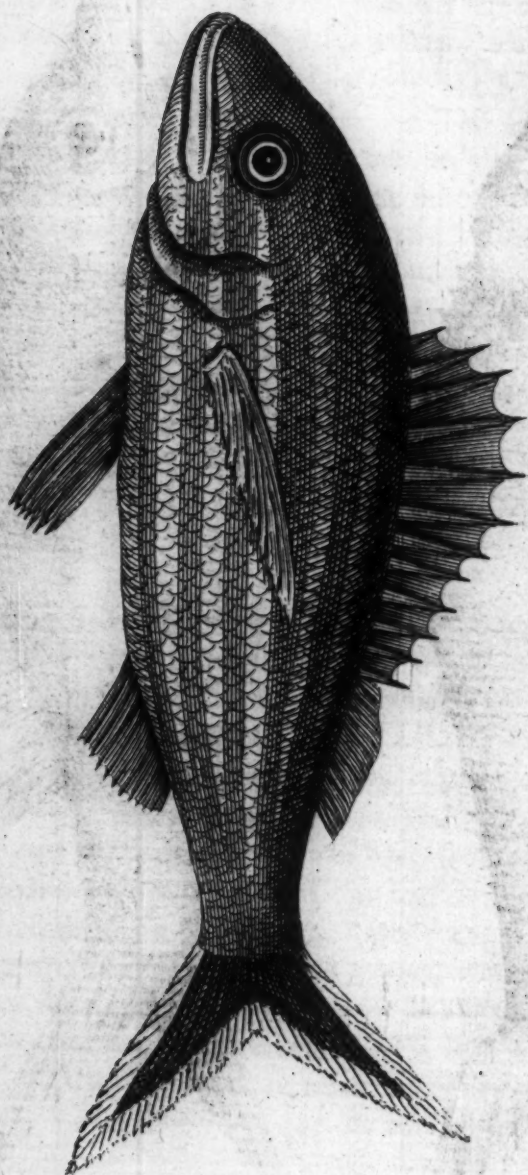


Fig: 5. Black Tail.

The *Dutch* furnish us with almost all we use. That which is clearest and whitest is best; and which being boil'd in Water and Milk, will almost all dissolve. *Ising-glass* is of very great use in Physick.

Fig. 5. The BLACK-TAIL FISH is commonly from six to ten Inches in length, and proportionably thick: The Back, Fins, and upper part of the Head, are of a dusky Colour, inclining to black; the Tail black, with a broad Border of yellow round it, and forked: The Sides are of a bluish ash Colour; with five Lines of bright yellow extending from the Head to near the Tail; the Eyes encircled with white; the Mouth large: The Head and Body in shape are pretty much like the *Bone-Fish*: It is furnish'd with Teeth like those of a *Pearch*.

Fig. 6. The **SQUIRREL FISH** is generally about twelve Inches in length, from the tip of the Snout to the end of the Tail; though some of them grow to four times that bigness: The whole Fish, excepting the first Fin on the Back, and the Sides which have a shade of white, is of a beautiful scarlet Colour; the Tail forked; the Eyes large, and the Mouth small: It has six Fins, of a singular form; the first on the Back is strengthened with many large sharp-pointed Bones, shap'd like Daggers; behind which shoots forth a long pliant sharp-pointed Fin, in shape exactly like one Fork of the Tail; the rest as express'd in the Figure, which is an exact Draught. This Fish is a well-tasted good eating Fish.

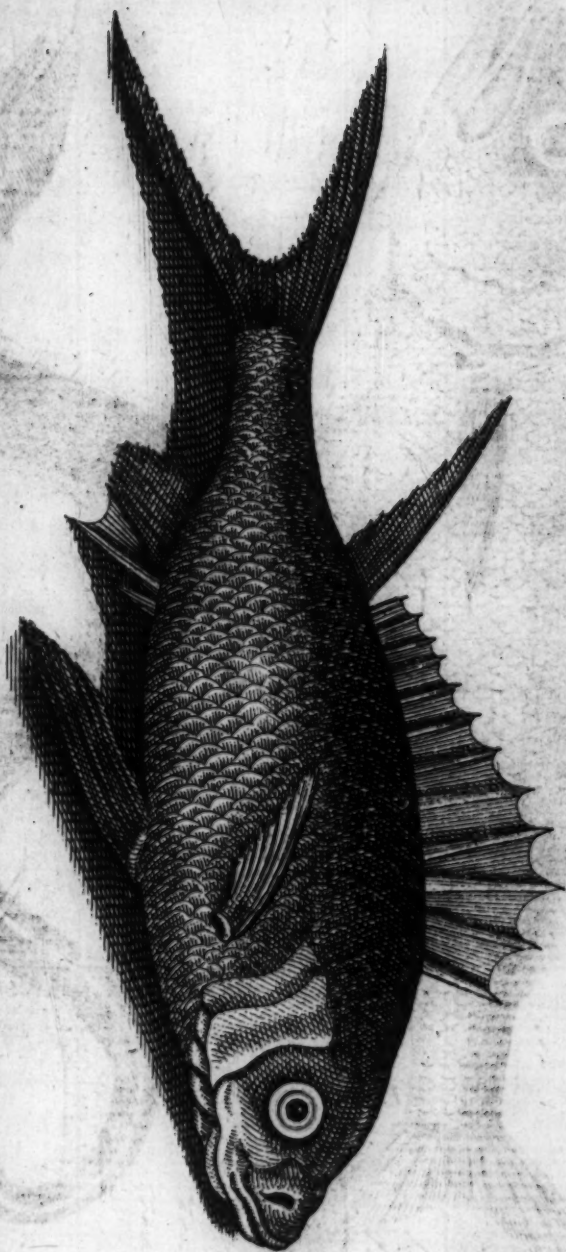


Fig : 6. Sea Squirrel, or Red Pearch

Fig: 7 Skip-Jack

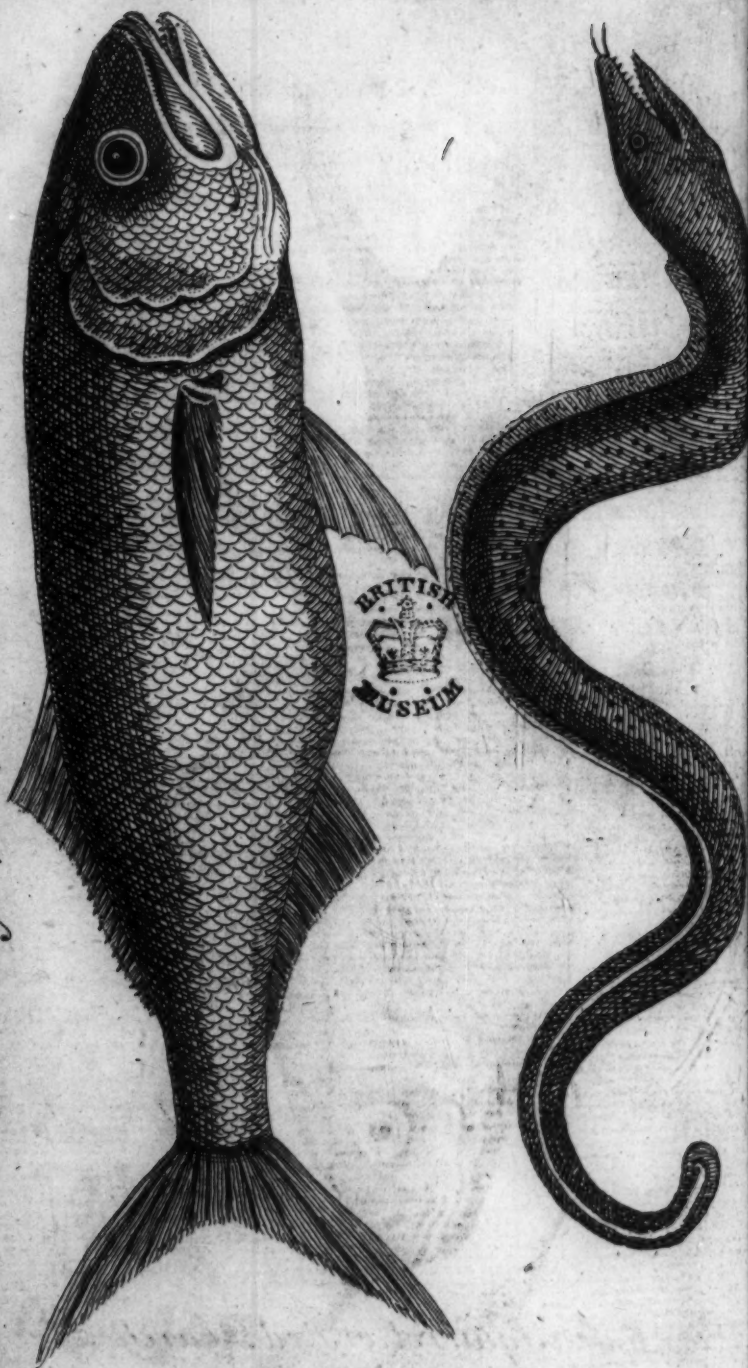


Fig. 7. The SKIP-JACK, so called in *Carolina*, from its frequent skipping out of the Water; but in *Virginia* it is called *Green Fish*, because when just taken, the Back and upper part of the Sides appear of a fine resplendent green Colour. This Fish is about twelve Inches in length; has a large wide Mouth, both Jaws armed with a single row of sharp Teeth; a bright Eye, encircled with yellow. It has five Fins, and a forked Tail. Its Scales are very small, and the Fish when alive is exceeding beautiful. It is a Fish of no disagreeable Taste, but accounted tolerable good Meat.

Fig. 8. The GREEN EEL is of the bigness of a large common Eel, and like it in shape. The whole Body is of a deep green, finely spotted with black. One kind of this Fish is of a light grey Colour sprinkled with innumerable black Spots; perhaps of different Sex only. The Inhabitants of the *Bahama* Islands will eat only the green sort, rejecting those which are black, as thinking them poisonous. It is customary for these Fish, as they are lurking among the hollow Rocks and Corals, to bite Peoples Legs that are exposed to them, though their bite is of no worse consequence than fetching Blood.

Fig. 9. The FRESH-WATER PEARCH is usually small, seldom found as big as a Man's Hand: the Back of a dark brown dusky Colour; the Sides of a fine blue, extended from the Head to the Tail, but more fainter towards the Tail; the Belly of a lovely golden yellow; and the Tail of a dusky yellowish Colour: It has five Fins, that on the Back and those under the Belly of a bright yellow, those on the Sides under the Gills white: The Eye is encircled with a golden yellow; across the Gills, which are of the same blue Colour as the Sides, are divers Lines of black pointing towards the Head; and just above the Fin on the side, near to the Gills, is a very remarkable beautiful red Spot, and joining to that a black one. Of these Fish there are plenty both in *Carolina* and *Virginia*: They are chiefly found in Mill-Ponds, and other standing fresh Waters; and called by some *Ground-Pearch*, from their burrowing into, and covering themselves in the Mud or Sand.

Fig. 10. The RUDDER-FISH is of the size of a small Roach, about four or five Inches in length: The upper part of the Body is brown, with large Spots of dusky yellow; the lower part of the Body is alternately streaked with yellow and white; and in the yellow Lines Dots of black: This Fish is every way curiously mark'd, and beautiful to behold. These Fish are commonly to be met with in warm Climates, and in crossing the *Atlantick* Ocean Ships Rudders are seldom free from them: They seem to gather

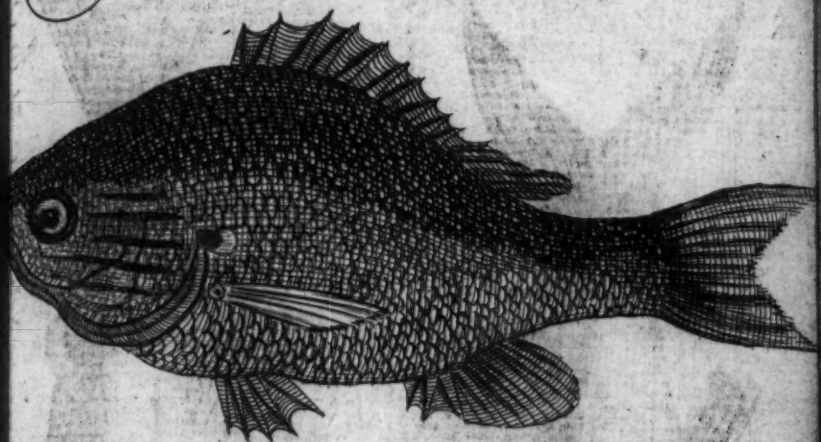
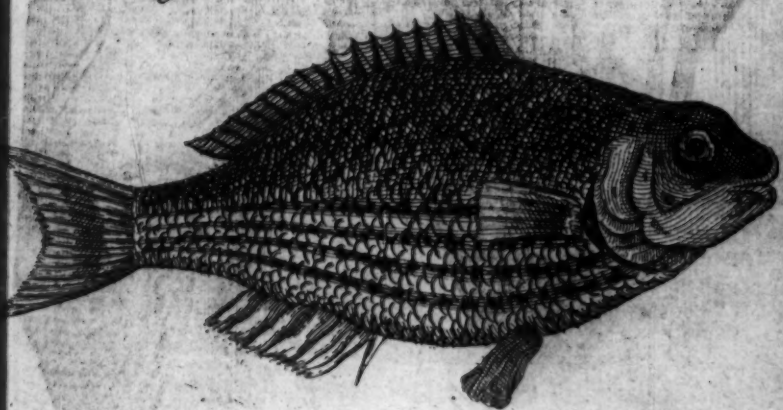
Fig: 9. Fresh water Pearch*Fig: 10. Rudder-fish.*

Fig. 11. Lane Snapper

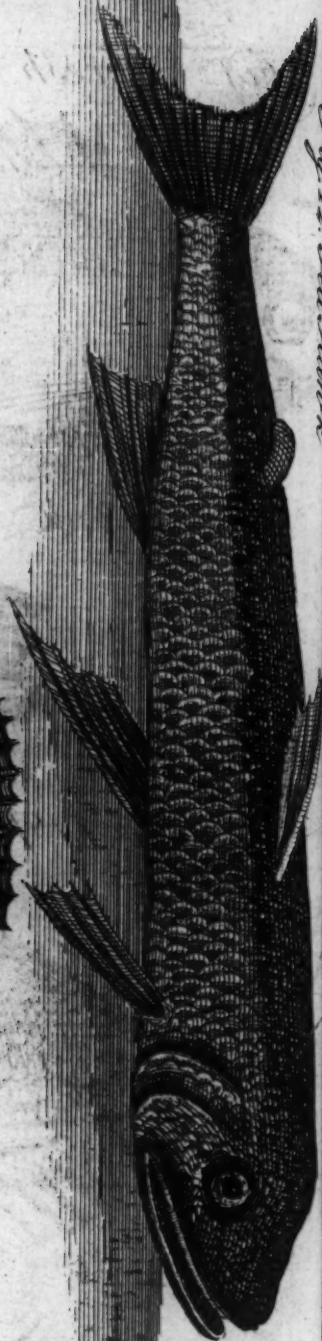
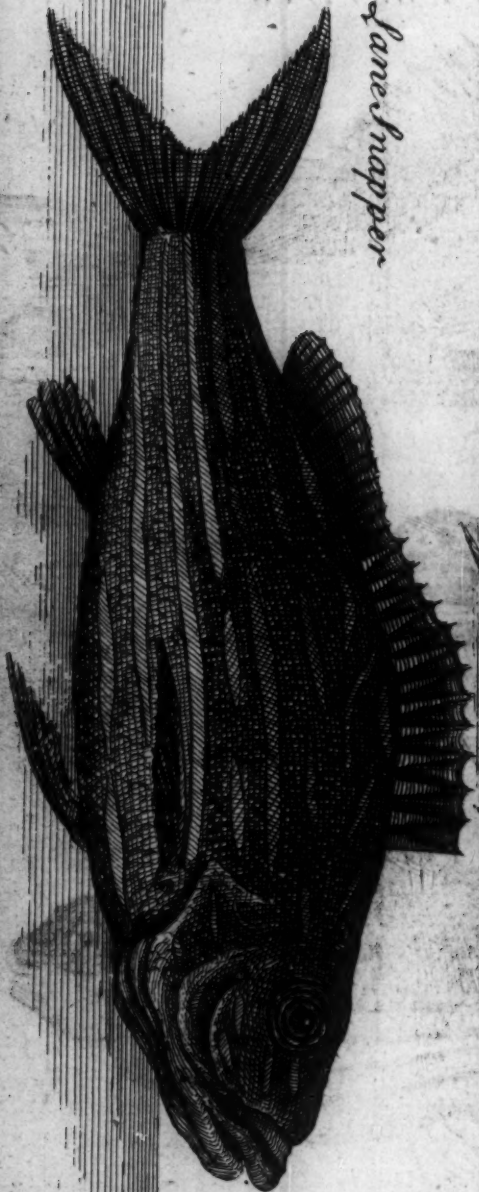


Fig. 12. Lane Snapper

gat
the
fo
swi
v
abo
red
Da
Th
Th
abo
lou
ligh
the
Mo
we
Ta
the
of
a
gr
the
stor
the
all
the
sw

gather their Nutriment from the Slime adhering to the Rudder and Bottom of the Ships; and though so small a Fish, they keep pace with Ships in their swiftest Course.

Fig. 11. The **LANE-SNAPPER** is in length about nine or ten Inches; the whole Body is of a red Colour, darkest on the Back; with Lines, and Dashes of bright yellow all over the Body and Head: The Fins yellow, and the Tail red and forked. The Eye is large encircled with red.

Fig. 12. The **SEA-HAWK** is a slender Fish about fourteen Inches long; of a dark brown Colour on the upper part, the Sides and Belly light. The Fins and Tail are of a reddish brown; the Eye is encircled with the same Colour. The Mouth is very large for the size of the Fish, and well furnished with small sharp irregular Teeth; the Tail is forked. These Fish are sometimes taken on the Coast of *Carolina*, but very rare.

Fig.

Fig. 13. The *Babama* UNICORN-FISH is sometimes found three Feet in length: The Body is of a very odd singular Form, thick in the middle, and tapering at both ends; the Head resembles that of a Hog's: It has a very small Mouth, with six Teeth only; two in the upper and four in the under Jaw: The upper part of the Head, Back and Tail, of a dark olive Colour; the Belly white; the Fins are of a pale red. The Body and Head of this Fish was marked all over very oddly with Lines resembling Worms and Maggots; of a beautiful sky-blue Colour: The Eye is large, encircled first with yellow, then with olive, then with yellow again, and lastly the whole circumvested with blue of the same Colour with the marks on the Body: besides those blue marks, the Body is sprinkled thinly over with black round Spots, like Patches: It has a tapering sharp-pointed Fin or Horn, growing out of the top of the Back, a little behind the Eyes; which it can raise and point either backward or forward at its pleasure, and when laid along reaches to the Fin on the Back: This Bone is very brittle, and easily broke, by which one would not think it so defensive a Weapon as otherwise Nature seems to have design'd it for. These Fish are not eat, being thought poisonous: They most frequent those Seas amongst the *Babama* Islands, where the Corals are most plentiful. Its Guts were full of small Shells and other coralline Substances, most of which was ground very small; which by the strength of its Jaws Nature has enabled it to perform.

Fig: 13.

Bahama Unicorn — fish



Fig. 14. The Blenn Fish

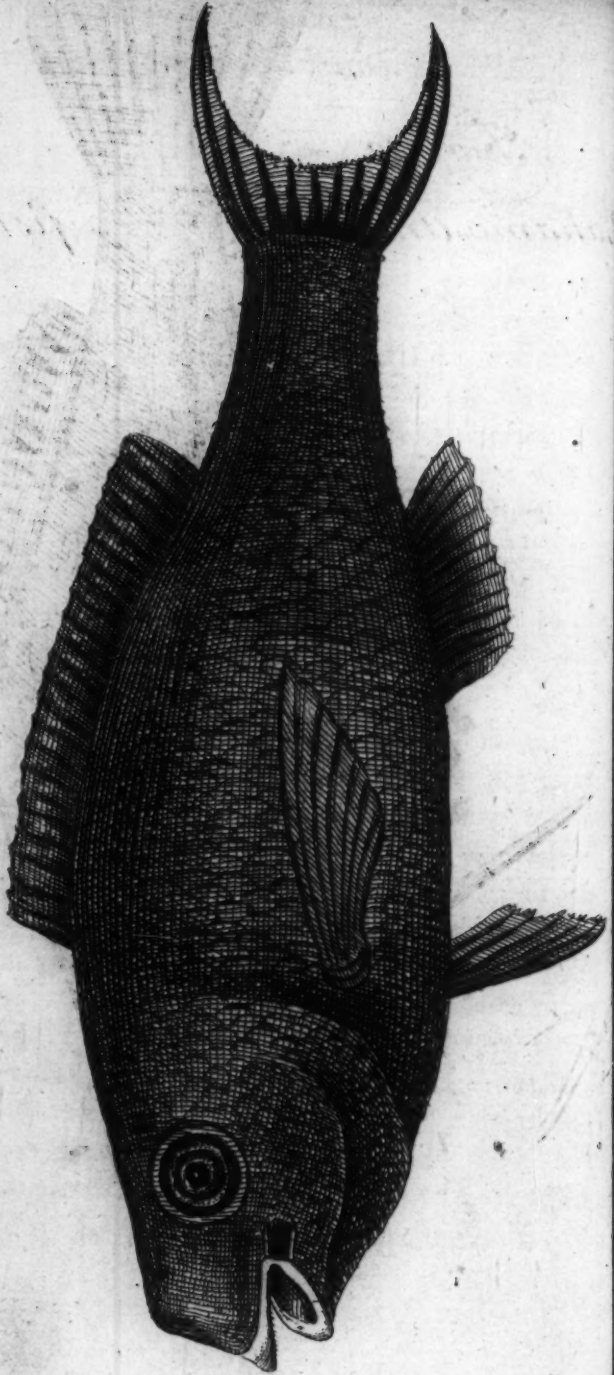


Fig. 14. The BLUE FISH is usually about a Foot in length; though sometimes they are found as large again: The Head is large; of an uncommon Structure, as the Figure represents, somewhat like the Whale's, which produces the *Sperma Ceti*: The Mouth small; the Eyes encircled with red; the Tail forked and strip'd with black Lines; the whole Fish of a fine blue Colour. They are frequently taken among the *Bahama* Islands; and in most of the Seas between the Tropicks.

Fig

Fig. 15. The Old PUDDING WIFE FISH is about a Foot in length; sometimes they are found sixteen Inches long: The Body of this Fish was of a dark olive Colour on the Back, the Belly and Sides lighter; cover'd with large Scales, having the upper edge of every Scale blue. It has a long yellow Fin on the Back, edged with a narrow border of blue, like a Ribbon, another Fin on the Belly, near the Tail, of the same Colour, edged in like manner: It has likewise a long Fin, shooting out from the upper part of the Belly, near the Gills, with the same Line of blue extending from the Basis to the Point. It has a broad beautiful Border that extends from the Fin on one side, quite under the Belly to the Fin on the other side, representing a Girt; with five Lines of blue and yellow alternately. The Eye is encircled with a lovely red, like Fire, from whence shoot forth seven bright blue Rays; which gives it the beautiful appearance of a resplendent Star. The Mouth of this Fish is not large; but its Jaws are armed with strong sharp Teeth; the upper Mandible is loose, and can be contracted, or drawn in upon occasion under the adjoining bony part of the Head, in like manner as in the *Hog-Fish*: The Tail is of a dark brown with a broad Border of yellow, inclining to red,

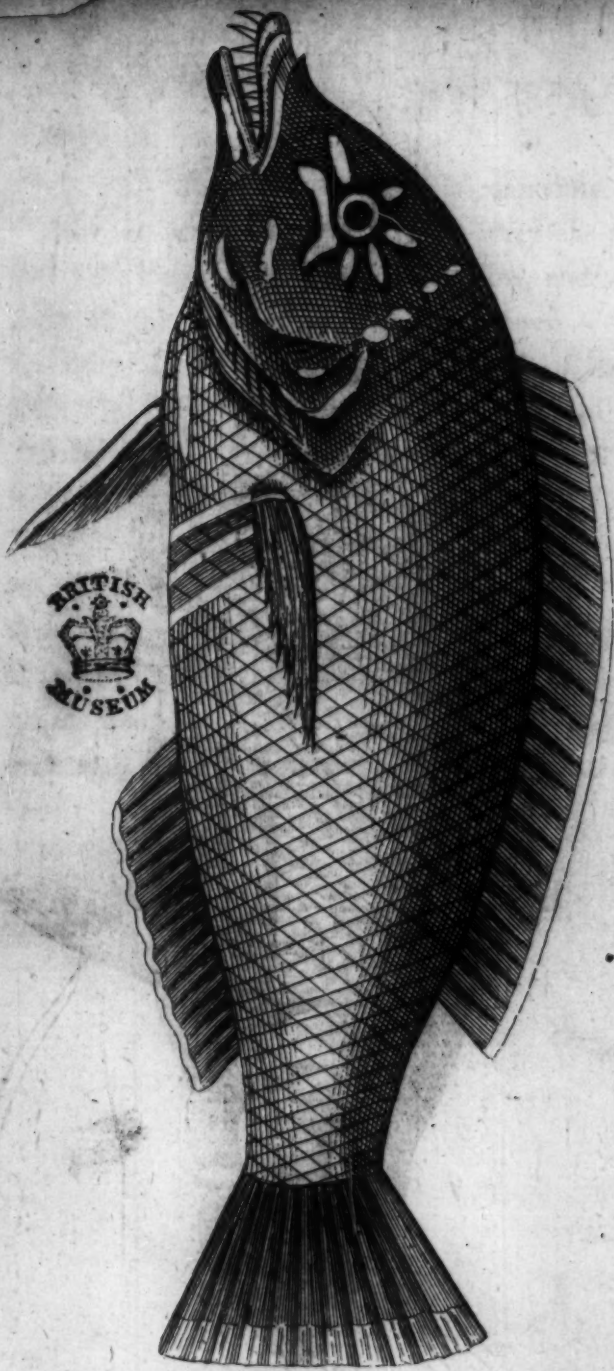


Fig: 15. Old Pudding-nose Fish

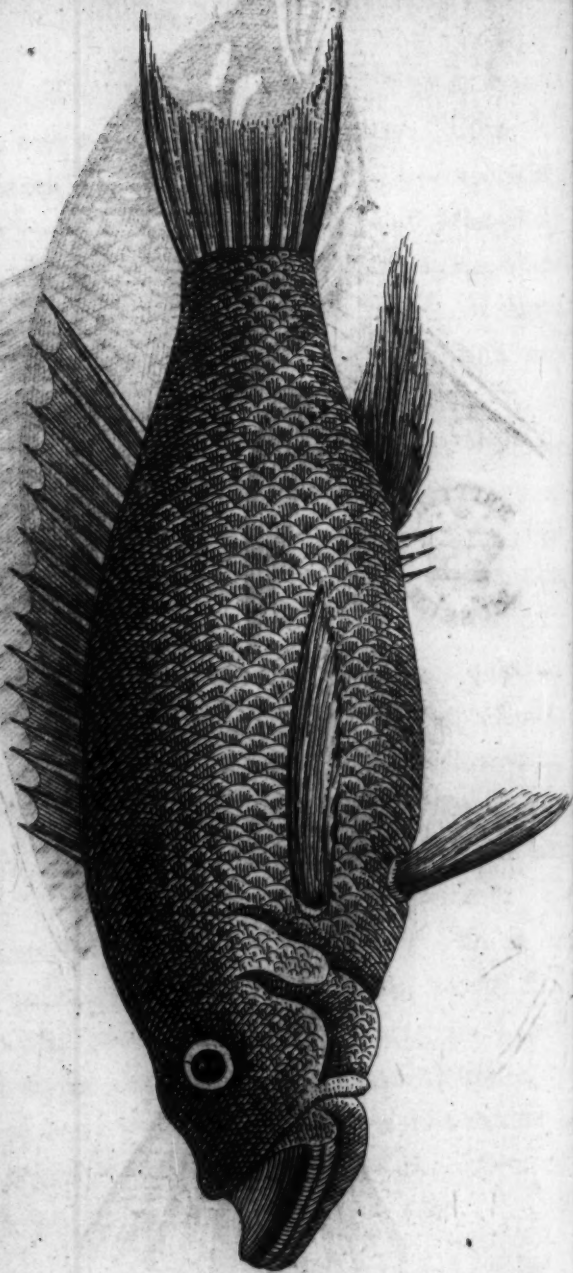
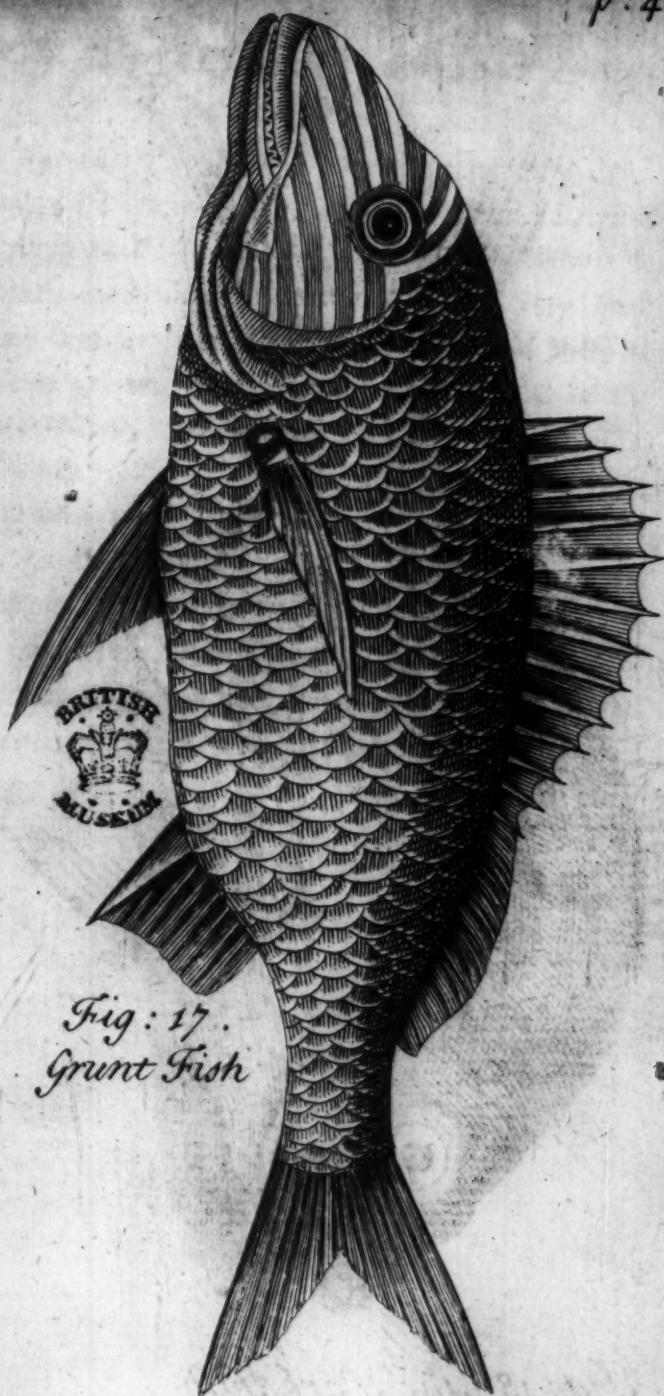


Fig: 16. Hog Fish .

Fig. 16. The HOG-FISH is commonly about a Foot in length; yet sometimes they are found two Feet long: The Head, Tail, Fins, and whole Body of this Fish are of a yellowish red Colour; the Belly somewhat lighter than the rest of the Body: The Eyes are encircled with a pale red; the Tail forked. The Head something like that of a Hog's, being sharp-snouted: The end of its upper Jaw is furnished with large sharp Teeth; opposite to which in the under Jaw are two of the same size; the rest of the Teeth are small, sharp, and thick-set: The upper Jaw is gristly, and so disjoined from the Head, that, like the *Pudding-Wife Fish*, it can either dilate or contract it at pleasure.

Fig. 17. The GRUNT is in length, from the tip of the Snout, to the end of the Tail, about twelve Inches: The Back of this Fish is of a dark brown Colour; the Belly and Sides of a light ash, inclining to blue; the Fins and Tail of a light brown: The whole Body is covered with large Scales, edged with yellow: The Head is elegantly striped with a bright blue, and a golden yellow Colour, alternately placed; which makes it appear as if the Head was cover'd with a rich strip'd Sattin. The Mouth of this Fish is large, the Eye encircled with yellow, and the Tail forked.



*Fig: 17.
Grunt Fish*

the
out
ark
sh,
ght
rge
tly
Co-
as
tin.
cir-

Fig.

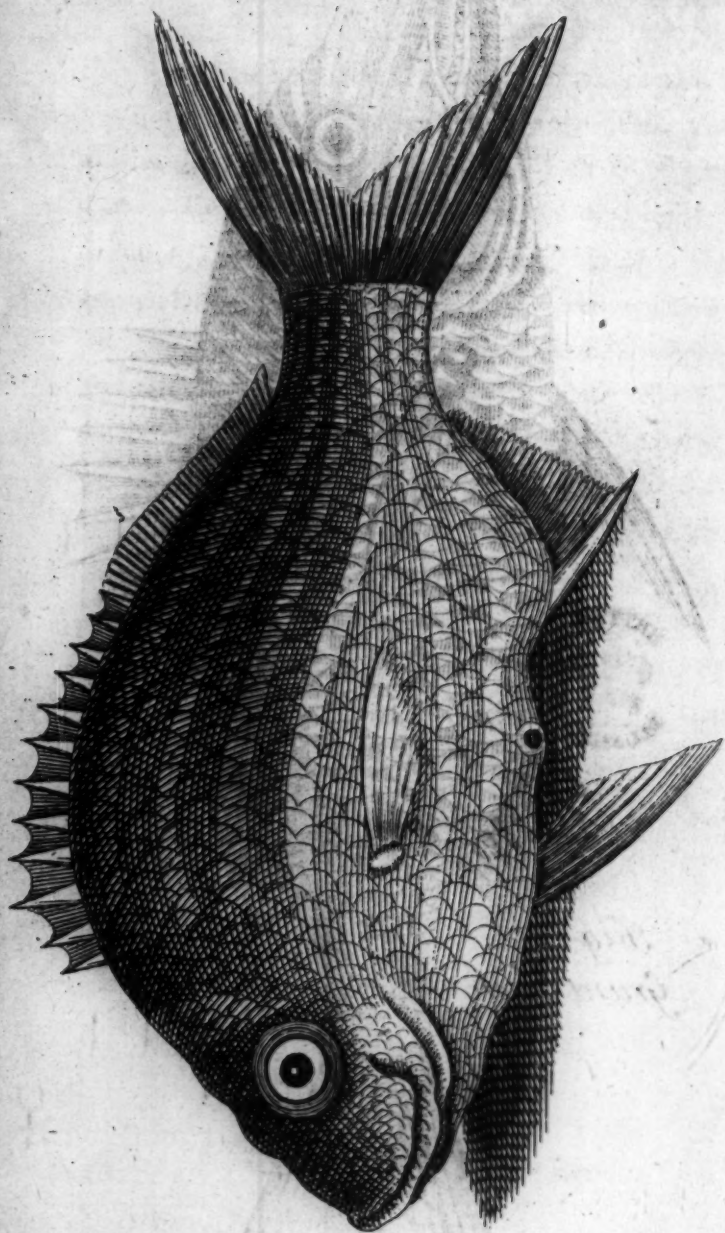


Fig: 18. The Pork Fish .

Fig. 18. The PORK-FISH is commonly about twelve Inches in length, and about five broad; with a rising Back: The Eyes of a bright yellow; its Mouth moderately wide, with many very small sharp Teeth: The Fins on the Back and Belly of a deep yellow, or orange Colour; the Tail of the same Colour, and forked; the Fins on the sides of a pale yellow: The Head, Back, and Sides of a dark blue or lead Colour, the Belly something lighter, six broad Lines extend from the Head to the Tail, of a bright yellow; it has likewise a mark of the same Colour between the Head and Back, pointing down a little behind the Eye. It is esteemed by the *Bahamians* a good eating Fish.

Fig. 19. The SCHOOLMASTER FISH, (so called by Mr. Catesby, but why, I know not) is a small Fish about eight Inches in length; tho' sometimes they grow to a Foot. The Head and Body is of a pale red Colour: Its Fins and Tail of a lovely gold Colour. It is remarkable this Fish has no Fins on the Shoulders, or Sides adjoining to the Gills, as usually found in most Fish; there are indeed some few others that want it likewise.

Since it is fall'n in my way in the above Description to make mention of Mr. Catesby; I'll take this Opportunity of making Acknowledgment, of the very great Assistance I have had from His History of the Natural Rarities of Carolina, Virginia, &c. to which incomparable Book I am indebted for most of my Fish; and to which I refer such curious Persons as desire a more ample and particular Account of the Animals and Vegetables of those Countries; it containing the most perfect Draught of the Birds, Plants, &c. as well as Fish, of any extant.

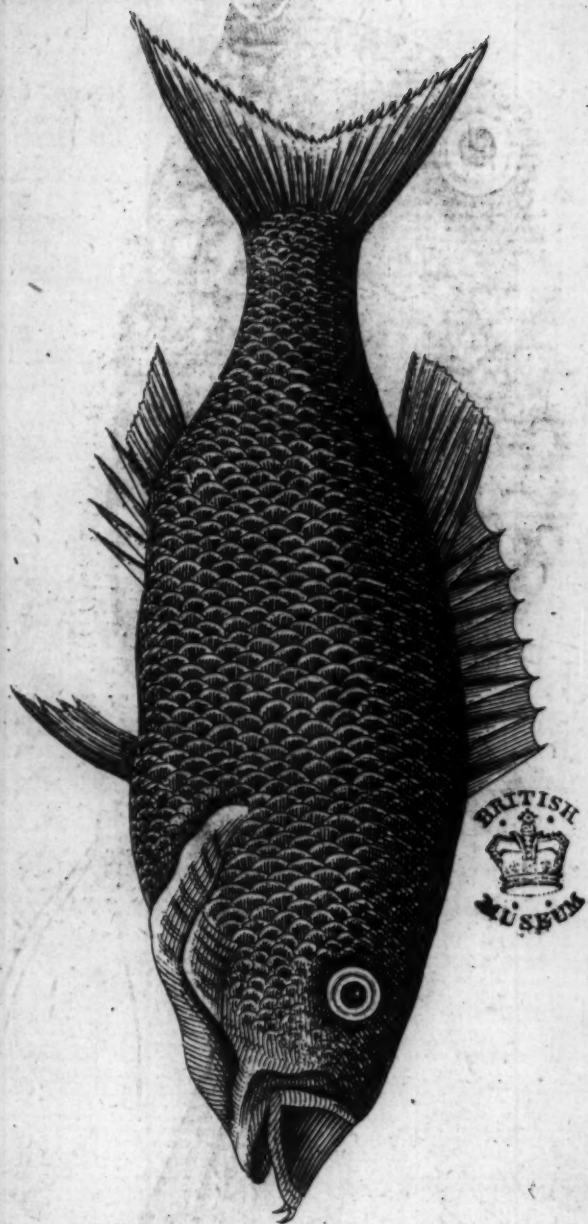


Fig. 19. School-master Fish.

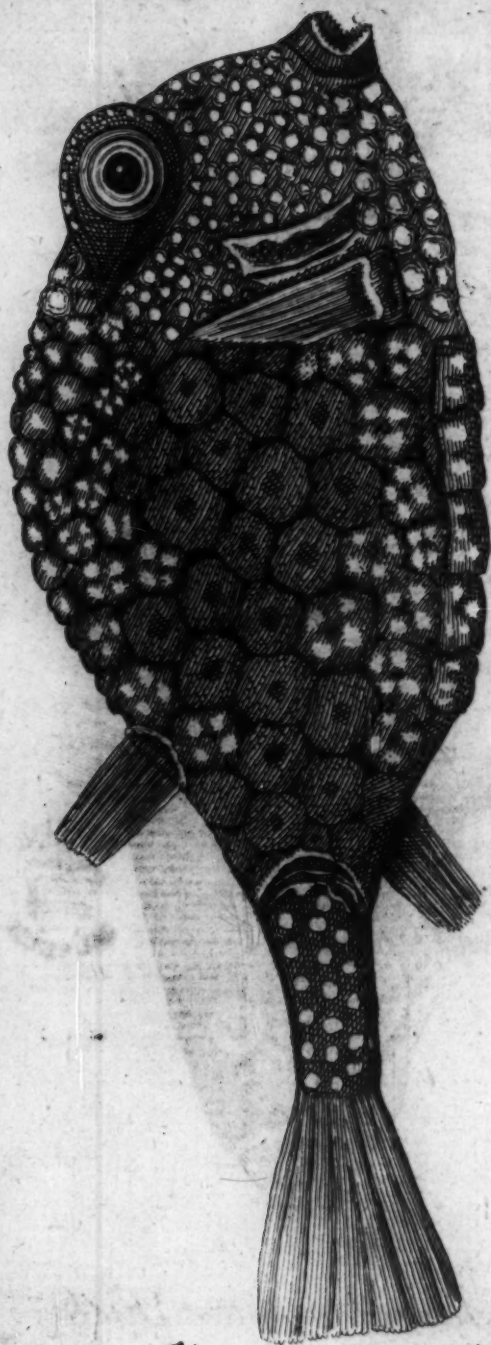


Fig: 20. Old-wife Fish

Fig. 20. The OLD-WIFE FISH (of which there are several Kinds) is commonly about ten Inches in length, and five in breadth: It has a rising sharp Back; the Belly flattish, three or four Fingers wide; from whence some have call'd it the *Triangular* Fish: It is cover'd with a hard crustaceous Skin, of a brown Colour, without Scales, curiously mark'd all over with indented Spots, large on the Sides, and smaller about the Head and Tail. It has a very small Mouth, with sharp Teeth, a large Eye plac'd high on the Head, of a remarkable Structure; two Nostrils or Vent-holes under the fore-part of the Eye; four Fins of a lighter brown than the Body, as is also the end of the Tail; the part of the Tail next the Body dark, long, slender, and which the Fish can, as it seems, draw up to its Body at pleasure, as it were into a Socket. These kind are seen in passing the *Tropick*, where they swim in large Shoals; and likewise in other Parts of the *Indies*: They are a white, firm, and wholesome eating Fish. It is taken with a small Hook,

Fig.

Fig. 21. Is the Male to the *Old Wife*, and therefore we call it the OLD-HUSBAND FISH. It answers to one of those Fish Mr. *Willughby* describes by the Name of *Piscis Triangularis Cornutus*. It is of a yellowish brown Colour like the Female, but more beautiful, finely mark'd all over the Body with large Marks, representing Stars, Marbling, and other curious Figures. It has two sharp Horns on the fore-part of its Head, growing from a thick Basis, about three quarters of an Inch in length, and tho' but slender yet very strong, with which it is capable of defending itself, and like a Bull, give dangerous Wounds to the Sides of its Enemy. His hinder part is likewise well guarded with two long strong Bones or Fins, like his Horns, one on each side of the Belly, near the Tail; and when closely chased, he draws up his Tail, and bids Defiance with these Horns to his hungry Pursuer. It is said these Fish swim in Companies, with their Females, for their mutual Defence; and notwithstanding they frequent the Ocean, exposed to the large, the bold, and voracious Kind, yet the Male being so well fortify'd by Nature, both with Weapons of Defence and Courage to use them, few dare attack him. The Figures of both Male and Female were taken from the Fish themselves; sent me by Mrs. *Ann Tilly*, a young Lady who is fond of such kind of Curiosities.



Fig: 21. Old Husband Fish.

Fig: 22. Yellow Fish

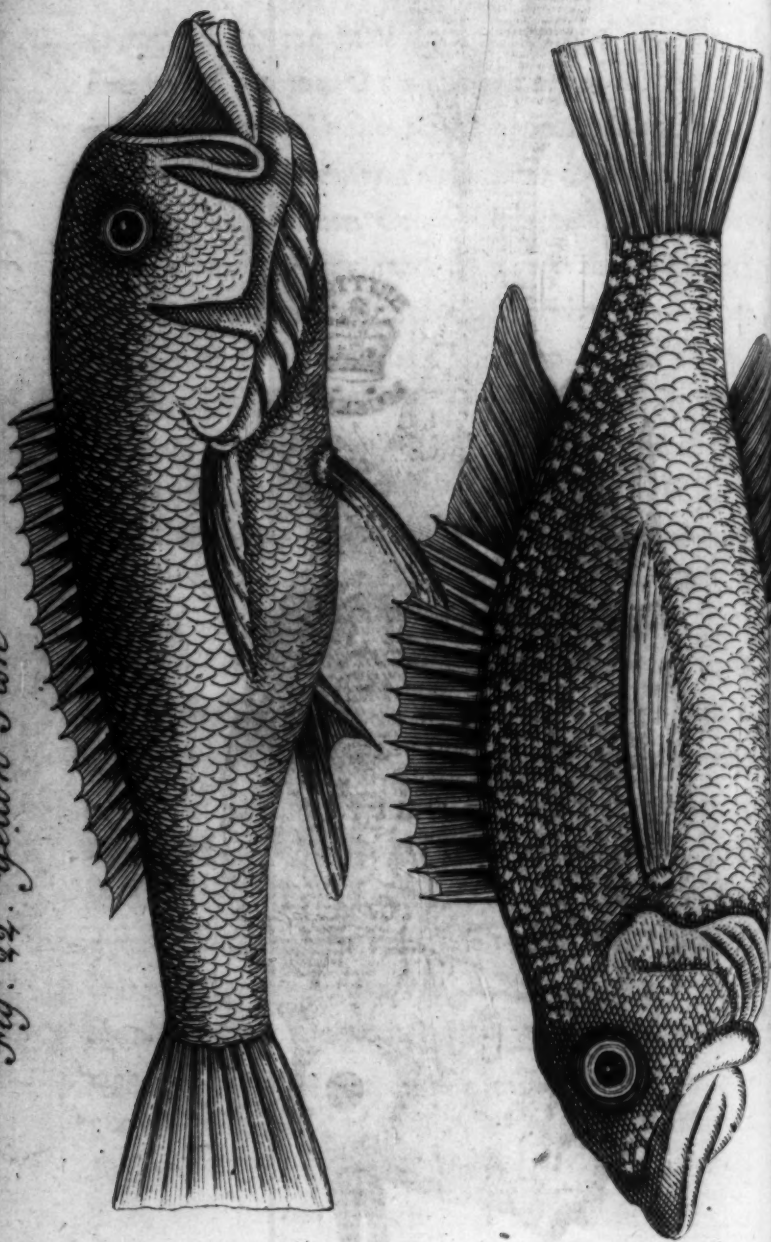


Fig. 22. The **YELLOW FISH** is a small beautiful Fish, commonly about nine Inches in length, though some are found twelve. The Head and Body is cover'd all over with small Scales of a yellow Colour, the Back somewhat darker than the Belly and Sides. It has five Fins, a long prickly one on the Back, two under the Belly, and one on each side behind the Gills: The Head is large, the Mouth wide, in the under Jaw a double row of small Teeth; in the upper are three large Teeth, with some very small ones within the Roof of the Mouth: It has a brisk lively Eye encircled with red.

Fig. 23. The **NEGRO FISH** is a small Fish, from six to ten Inches in length, and in shape not unlike a Pearch; the upper part of a dark brown Colour; the under somewhat lighter: The Head and Body is sprinkled thick all over with small bright sky-blue Spots. The Fins are of a reddish brown Colour: The Eye is encircled with a golden yellow: The Mouth wide, with a single row of sharp Teeth in each Jaw.

Fig. 24. The TANG in the shape of its Body is something like the *Bream*; about ten Inches in length, and about eight wide; though some are taken twice that bigness: The whole Fish is of a dark blue Colour: the Mouth of a very singular Form, as the Figure expresses, without Teeth. It has a large prickly Fin on the Back, reaching from the Head almost to the Tail; two on the Belly, one large like that on the Back, and a long slender one towards the Head: The Tail is large, and spreads very wide, both sides shooting into sharp Points; and as it wants Teeth, Nature has supplied that Deficiency by arming the Tail on each side with a strong sharp-pointed Bone, which in defence of himself he extends when Danger approaches. This Weapon, with its prickly Fins, seem to deter the voracious Kind that prey on others, from attacking him. Yet I have seen (says Mr. *Gatesby*) a *Barra-cuda* pursue and bite off a third part of him behind; which when he had swallowed, he deliberately bit off half the remaining part, and devoured the whole Fish at the third Mouthful. The *Tang* is accounted a good eating Fish.

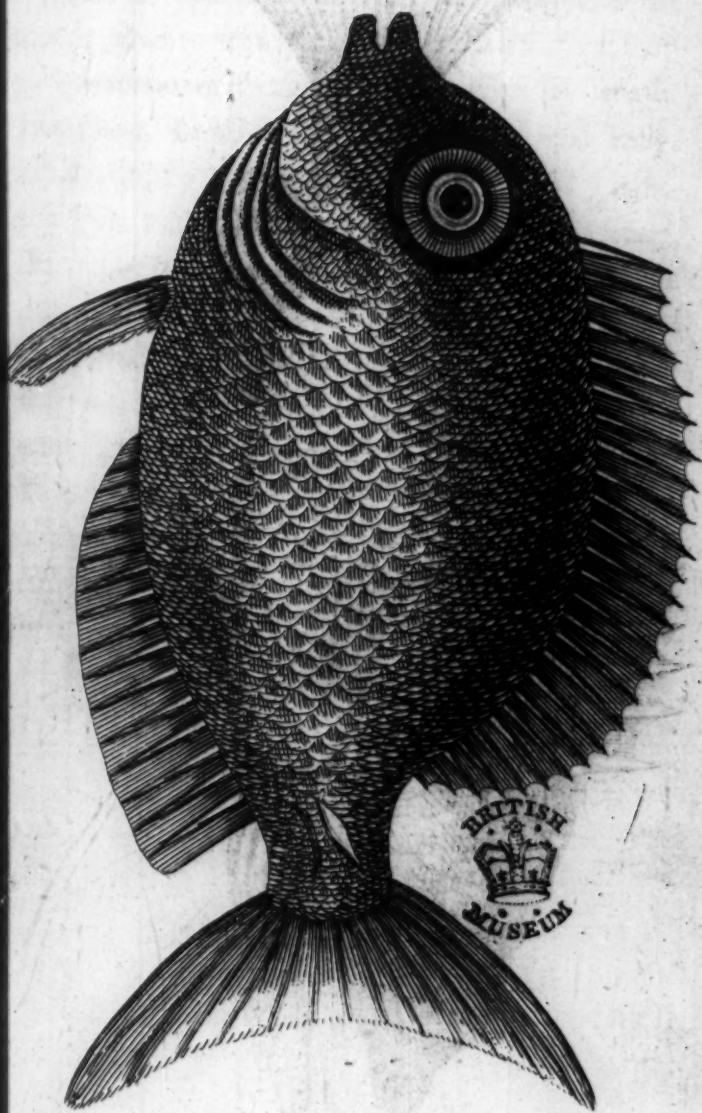


Fig: 24 . The Tang .

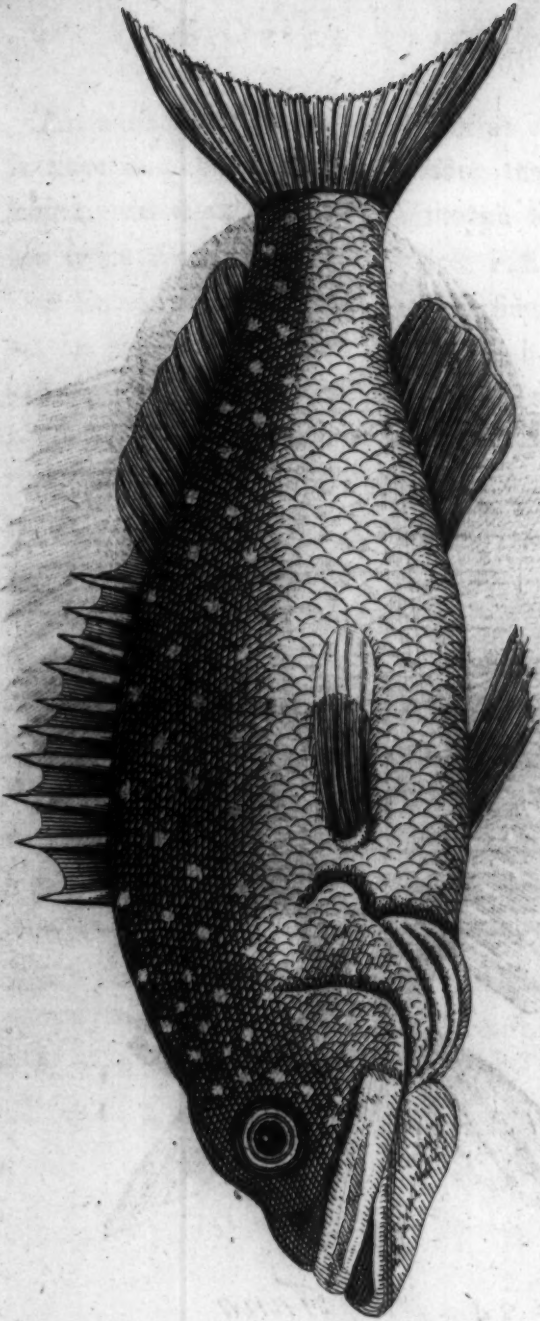


Fig: 25. Rock Fish

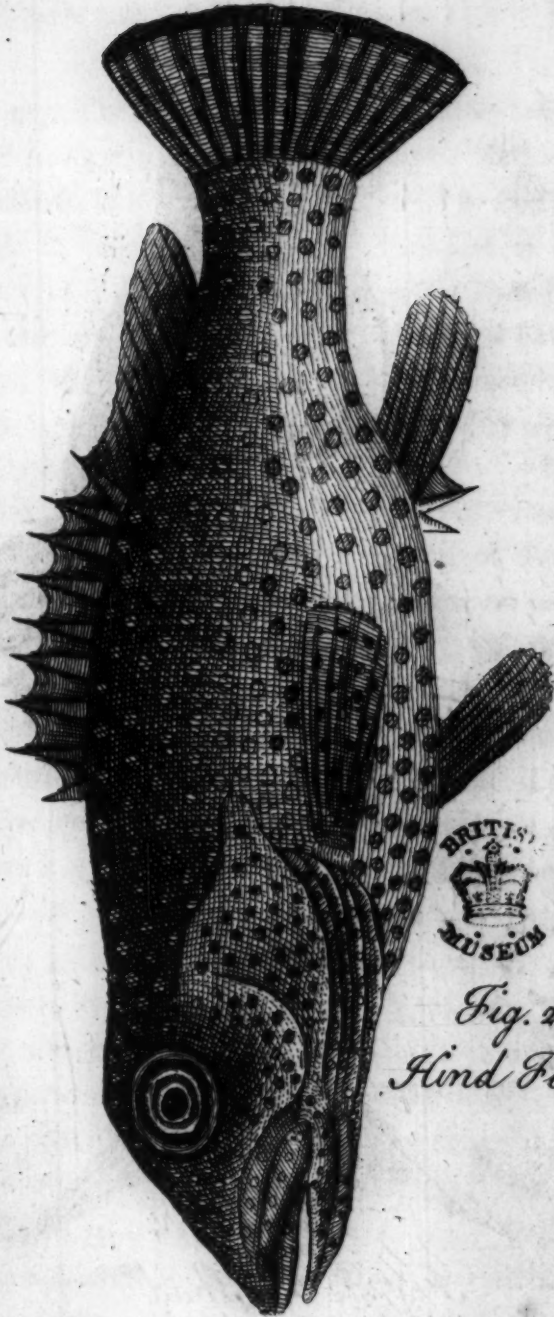
from
are
Th
are
inf
yel
ov
a f
lay
wo
In
par
for
ces
but

Fig. 25. The ROCK-FISH is usually found from twelve to eighteen Inches in length; yet they are sometimes caught two or three Feet in length. The Head, Back, and Fins on the Back and Belly, are of a dusky blue or lead Colour, the Belly lightish: The Fins behind the Gills are of lead Colour, yellow at the Ends. The Body is sprinkled all over with red Spots: It has a large Mouth, and a full Eye, of a lovely scarlet Colour. Mr. Catesby says, this Fish for its poisonous Quality, has the worst Character of any other among the *Babama* Islands; but whether they are eatable from any particular Places he knew not; many of their poisonous Fishes being not so when taken in some Places; of which the Inhabitants can give a near guess, but sometimes they are miserably deceived.

Fig.

Fig. 26. The HIND FISH is commonly about twelve or fourteen Inches in length, though some of them are found near twice that bigness. The whole Fish instead of Scales was cover'd with a thick Skin variously coloured; *viz.* the Head of a muddy red, the Back of a dark reddish brown, the Sides green, and Belly whitish with a Tincture of red: The whole sprinkled over thick with red Spots: The Fins on the Back, Belly, and Sides of a light brown; the Tail of a dark lead Colour, inclining to blue, striped and border'd with black. It has a large Mouth, with small Teeth; a full Eye, encircled with red and yellow mixed together: The Back of this Fish is well guarded with strong sharp Fins, or Bones, set up like sharp-pointed Stakes. The *Hind-Fish* are plentiful in the shallow Seas of the *Bahama* Islands, and are accounted good Meat.

bout
some
The
thick
uddy
Sides
red :
pots :
light
ng to
large
ircled
ck of
Fins,
The
f the
t.



*Fig. 26.
Hind Fish*

Fig.

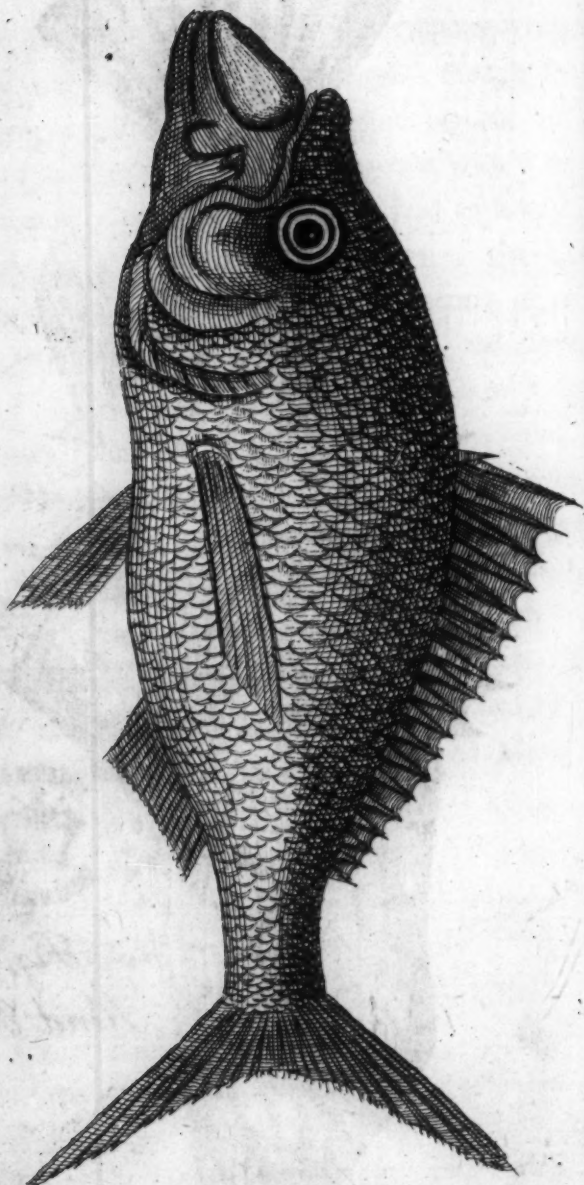


Fig: 27. The Shad

Fig. 27. The SHAD is of a light grey, with some of its Scales tintured with purple. It has a small Mouth, without Teeth: But what is most remarkable in this Fish is, that the fore-part of the Head was of a cartilaginous Substance, the back-part strong and bony; which seems design'd for a Shield to secure the defenceless part, which he contracts under it when Danger approaches. It is esteemed a good eating well-tasted Fish.

Fig. 28. The SOLDIER is a kind of *Craw-Fish*, found in several of the *American Isles*, particularly in the Island of *St. Dominico* in the *West Indies*, where there are great Numbers. It is about three or four Inches in length, and so called, because he is clothed and armed with a foreign Shell. These Creatures go down sometimes to the Sea-Coast; but whether it is to wash, and to cast their Eggs, as the Land-Crabs do, is not known; but this is certain, that they go to change their Shells, which every one endeavours to find out according to his size: and finding what may fit 'em, they run themselves backwards therein, and so cloath themselves anew: and being arm'd like Soldiers with these foreign Shells, they march up again to the Woods, and take up their Quarters among hollow Trees, &c. living upon rotten Leaves, Fruit, &c. where increasing in Bulk, and the Shell becoming too straight for them, they are obliged to go down to the Sea-Coasts to

F

change

change their Houses again. The Curious, who have made Observations of what happens during this Exchange, have own'd, they took a great deal of Pleasure in the sight; for these Creatures stop at every Shell they meet with, consider it diligently, and having met with one they like, immediately quit the old one, and run themselves so swiftly backwards into the other, that one would think they were either afraid of the Injury of the cold Air, or ashamed to be seen naked; and if two of them meet at the same time stripp'd, to enter into one and the same Shell, they will bite each other, and battle it, till such time as the weaker yields, and quits the Shell to the Conqueror; who having cloath'd himself with it, takes three or four turns upon the Shore, and if he finds it does not fit him, quits it again, and has immediate recourse to his old one, and then seeks out for another; and thus they will change five or six times, till they meet with one for their Purpose. They carry in their Shells about half a Spoonful of clear Water, which is a sovereign Remedy against the Pustles and Blisters that the wet which drops from the *Manchineel* Tree raises upon the Skin.



Fig. 28. The Soldier

Caterpillar Fig:1.

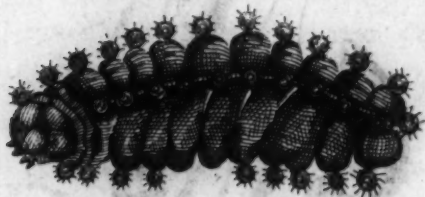


Fig:2.



BOOK the Fourth.

Of INSECTS.


Fig. 1.  S a curious CATERPILLAR; the Body of an uncommon Structure, being exactly four-square; and of a dark green Colour, mark'd with yellow and red: The Edge of every Square was furnished with little round Heads or Balls, standing at an equal distance, one on the top of each Joint or Partition, all of them full of Hair, and of a fine scarlet Colour. Its Feet, and little Claws, were wrapped in a thin transparent Skin, as was also the covering of the Belly; that as it crawled no Feet were seen; but by means of this little Skin, the Caterpillar sticks fast to any thing like a Snail. It was found crawling on a Leaf of the *Battatas*: on the 22d of *July* it made itself a Web, of an oker Colour; from whence on the 23d of *August*, that beautiful FLYING INSECT, *Figure 2.* was produced.

Fig. 2. The upper part of the Body of this Insect was black, finely mark'd with a golden yellow; the Head, and part of the Wings before black, vein'd

F 2

with

with gold; the outer part of a yellowish brown: The under Wings of a lovely rose Colour; the Legs and under part of the Body were black. These Insects, and some of the following ones, are found in the *Indies*; described by *Merian*.

Fig. 3. Is an INDIAN Insect of the CHAFER Kind; very common to be met with upon the Pomegranate Tree; of a heavy and sluggish Nature and therefore easily catch'd. It is furnish'd with a long Tube or Trunk, under its Nose; which it very dextrously fixeth in the sweet Flowers to suck the Honey out, thro' the same. When it prepares itself for its Transformation, it lies motionless for a considerable time, till at length the Skin on its Back breaking of its own accord, there comes forth the FLYING INSECT, *Figure 4.* the Wings of which are transparent, of a pale rose Colour, streaked and veined with scarlet, and border'd all round with a pale yellow: But what is remarkable, it preserves the same Trunk, or Body, which the foregoing *Chaffer* has, from whence it is produced; leaving its old Skin or Shell, in Situation, Shape and Colour, resembling the primitive Insect; which Colour was of a deep green. These *Flies* are very frequently found about *Surinam*; they are very swift in flying, insomuch that *Merian* says, he spent several Hours in catching one only. This Fly makes a sound like an Harp, to be perceived at a distance by its Singing; for which reason it is called *Lyriceen*, and by the Dutch *Lierman*. From these kind of Flies, (as the *Indians* say) are produced the famous Fly called the *Lantern-Bearer*.

Fig. 3.



Fig. 4.

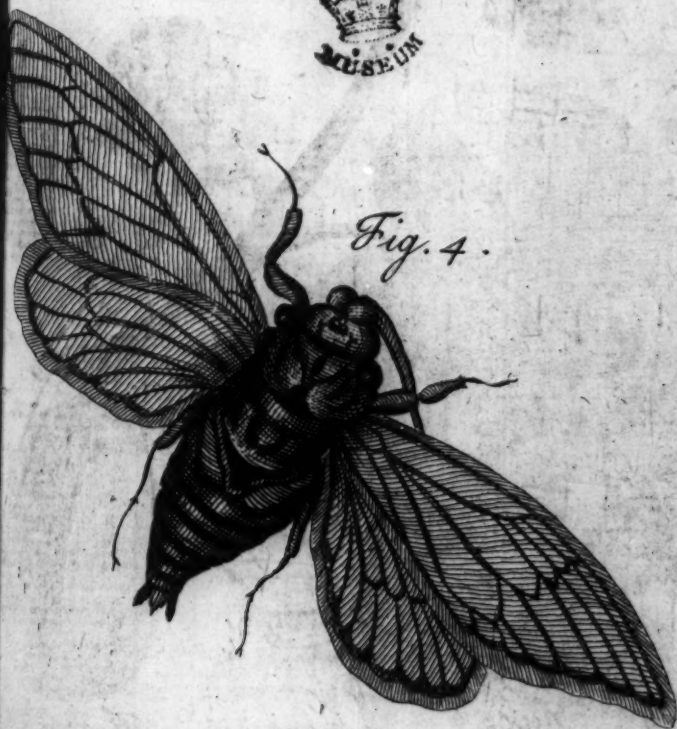


Fig: 6.



Fig: 7.

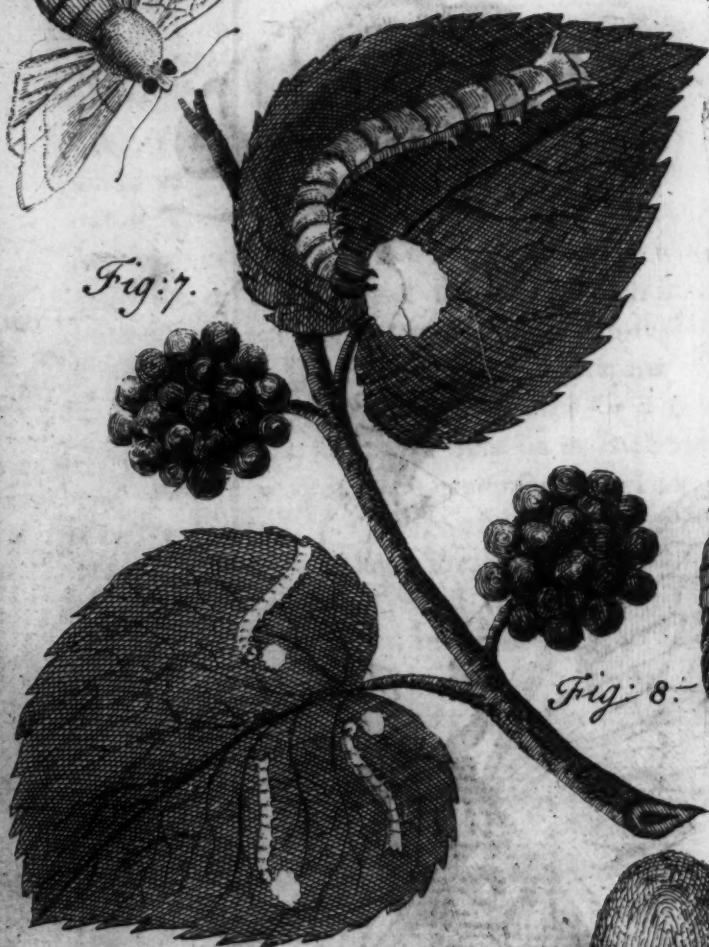


Fig: 8.



Fig: 5.



Fig: 9.

Fig. 5, and 6. Are the Male and Female *Moth-Flies*, from whence the *Silk-Worm* is produced, which are hatch'd from an Egg of the bigness of a Mustard-seed. The *SILK-WORM*, Fig. 7. is of a pale cream-colour inclining to white. During this Form it constantly undergoes four Sicknesses, each lasting about three Days, wherein it feeds not at all, but grows thicker, shorter and clearer, and at each Sickness changes its Skin. It after changes from that of a Worm to an *Aurelia* or *Chrysalis*, Fig. 8. whereunto it is transformed after its spinning time; in which State it lies shut up in hot Countries for fourteen or fifteen Days, in more temperate ones eighteen or twenty Days, without any Food known to us: during which time this Insect leaves two Skins, both that of a Worm when it is changed into an *Aurelia*, and that of an *Aurelia* when it becomes a *Moth* in its Silk-case. Its last Transformation is from an *Aurelia* to a *Moth*, which eats its way out thro' the sharp end of the Case, Fig. 9. by a Hole just big enough to creep thro'. This last Change into a *Moth-Fly* is the Perfection of this Insect. In this State the Male and Female couple, and soon after die; the Female having first laid her Eggs, which are of a pale yellow Colour, but in a few Days change into a dark grey or liver Colour. And, what is wonderful, these Eggs are kept ten Months in the Year as a dead thing, taking Life again in their Season. The first *Silk-worms* that were brought into *Europe* was in the time of *Justinian* the Emperor, who began his Reign *A. D.* 526. till then the *Europeans* were so ignorant as to the Knowledge of the Production of Silk, that they imagin'd it grew on the tops of Trees, as Cotton; and was in all those Western Parts for a long time very dear, being weight for weight of equal Value with Gold, a Pound of one costing a Pound of

the other. *Persia* was the only Place which the *Europeans* frequented, for the sake of their Silk: and it is certain that the *Persians* took care, for many hundred Years, to keep their Silk-Manufactures to themselves, not permitting the *Silk-Worms* to be carried out of *Persia*, or any Persons to pass from thence into the West, who were skilled in managing them. *Justinian* looking on it as a great Hardship, that the Subjects of his Empire should buy this Manufacture of the *Persians* at so dear a Rate, in order to put an end to this Imposition, sent two Monks into *India*, (understanding that there was plenty of Silk in those Parts) to learn there how the silken Trade was managed; and on their Return to bring with them (if it was possible to be procured) some of the Species, whether Vegetable or Animal, from which the Silk was produced; that so he might set up the Manufacture in his own Dominions. These Monks, when they returned, told the Emperor, That the Silk was produced by a living Creature, a Worm, which could not be brought so long a Journey alive. But understanding from them that its Eggs might be brought; from which the Creatures might be propagated; He sent them back a second time, to bring him of those Eggs: Who having effected what they went about, brought to *Constantinople* great Quantities, which they presented to the Emperor in great State on Horseback, (accompanied by many of his Nobles, Senators and Magistrates) enclosed in a Roll or Horn of Paper, with Instructions how to breed, nourish, and draw Silk from the said Creatures: which was received with great Applause and Admiration; and from those Eggs have been propagated all the *Silk-Worms*, and their Silk in *Europe*.

At the Season of the Year for hatching the *Silk-Worms*

Worms Eggs, which, as observed, is about the beginning of *May*, provide some Sheets of fine white Cap-Paper; each of these Sheets make into the form of a Dripping-Pan, by turning up the edges of the Paper about an Inch and half on every side: in these Paper Pans put the *Silk-worms* Eggs, placing them in a Chamber-Window, where the Sun shines powerfully upon them, and securing them from Cats, Birds, &c. there leave them Day and Night to hatch of themselves; and when you perceive the Worms begin to come out of their Eggs, give them young Mulberry-Leaves, or for want of them, the Leaves of Lettuce, till they can have Mulberry-Leaves; and then keep them constantly to that Diet: After this manner, in these Paper Troughs or Pans feed them till their Spinning-time, taking care to clean them as often as Occasion requires; and if you are minded to remove the Worms to other Paper Troughs, that they may lie thinner and cooler, give them a few fresh Leaves, and the Worms will come presently upon them: These Leaves remove with the Worms; but if they are grown large, take them gently in your Hands, and put them into other Troughs. When the Worms have fed their full time, and are ready to spin their Silk, roll up white Paper like a Wafer, these pin up against the Hangings of a Room, or to Lines tied cross the Room; in these Papers put every single Worm, as you perceive it wants to spin, which it will begin to do generally as soon as it is put into the Paper. When the Worm has finished its Case, and changed into an *Aurelia*, which is known by hearing it rattle, when it is shaken at the Ear. Then proceed to wind off the Silk, never suffering the Moth-Fly to eat its way out of the Case, not even of those that are designed to

pro-

propagate Seed for the next Year. A Gentleman very curious in his Observations and Experiments upon the *Silk-Worm*, his Method in winding off the Silk is, as soon as the Worms have finished their Bottoms, and changed into *Aurelias*, to put the Bottoms into warm Water, with some Spirit of Wine in it, which he says facilitates the winding off the Silk very much; the Ends he finds more readily, and winds them on a Card in his Hand, without any Reel or Machine at all: And as the Silk-Bottoms are wound off, he takes the *Aurelia* of each, and places them in one of those clean Paper-Pans, erect upon the piqued end; and when its time is accomplished, to enter upon its last Transformation of a Moth-Fly, it will assume its new State, as well as if it had continued the whole time in its Silk-Cafe; and this Method is practised by divers other Persons, who wind off the Silk after the same manner. When the Silk-Moths are come out of their Cafes, being perfectly transformed, and are put into such Paper Dripping-Pans, or Troughs, as they are bred in, there they will couple and lay their Eggs: When that is over, the Papers with the Eggs upon them (never attempt to take the Eggs off) are to be put into a Chest or Trunk one upon another, among wollen Cloths; and without any other Art or Means, there let them remain till the next Spring. Some Ladies who keep *Silk-Worms*, besides the Pleasure they take in feeding and observing these wonderful Creatures, make use of the Silk-Cafe, which they cut (after the outer Sleeve or Down is off) into artificial Flowers to wear in their Heads, which they themselves paint and colour, to imitate Nature.

Fig. 10. The Caterpillar from whence this curious BUTTERFLY was produced, was of a fine scarlet Colour, strip'd with yellow: They are frequently found crawling on the *Vanilla* Plant, and likewise on that call'd the *Passion-Flower*. Merian says, she fed one of these Caterpillars till the latter end of May; it then, according to the usual Transformation of the *Butterfly* Kind, chang'd into an *Aurelia*, and on the seventh of June following, became the *Butterfly* in the

Butterfly Fig. 10.

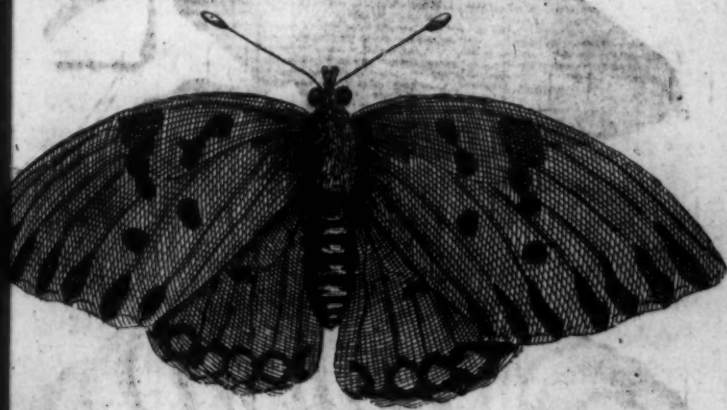


Fig. 11.



Fig. 13.



Fig. 12.



Fig. 14.



Fig. 15

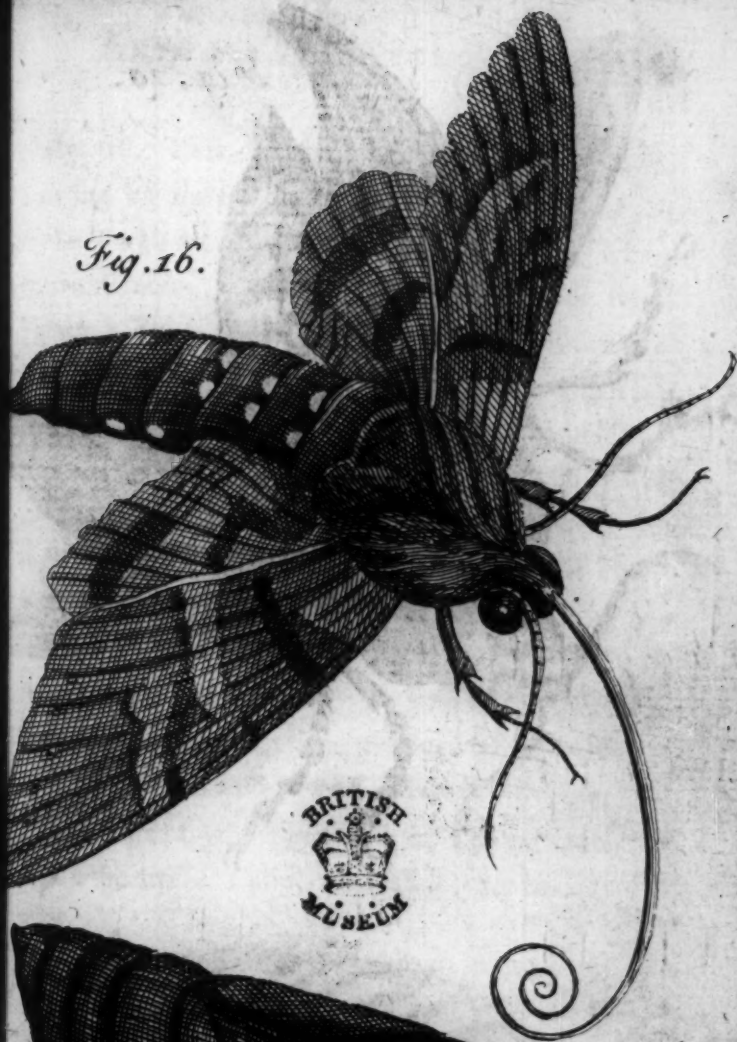
the Plate, *Fig. 11.* the upper side of which was of a bright red, curiously mark'd with black; the inner side of a dusky yellow, or pale saffron, richly spotted with silver: The upper part of the inside of the Wings, next the Head, was of a pale red with black Spots, studded with silver. These kind of *Butterflies* are found in the *Indies*.

Fig. 12. Is a curious Insect of the *BEE TLE* or *CHAFER* Kind: Its Back was black, with a yellow mark cross the middle, in the form of a Half-moon: The upper part of the Wings, the Horns, Feelers, and two Joints of the Legs next the Body, were all of a fine crimson Colour; the ends of its Legs of a pale yellow; the Body under the Wings of a bright yellow. This Insect turns its Horns back over its Body, the points of which meet and make a kind of Circle. It was produced from the Worm or Maggot, *Fig. 13.* which was found feeding on the *Carduus*, or Thistle, growing in the Fields of *Surinam*.

Fig. 14. The great black *BEE TLE*, or *CHAFER*, is produc'd from the Worm *Fig. 15.* called in *Dutch* the *Palmyr-Worm*, because it gets its Food in the *Palmer Tree*. The Worms are generated in the Trunk of this Tree in great abundance, which feed on the Pith of it; they are a little bigger than Mites in Cheese, at first, but at last grow to the bigness of the Figure represented in the Plate. The *Indians* lay these Worms on the Fire, and when roasted eat them very greedily, and think them a delicious Food.

Fig. 16. This Insect was produc'd from a *Caterpillar* of a bright red, and white Colour; with a black Spot on the last Crease or Partition of its Body; the middle of which was remarkable for its little white Skin, shining like Crystal; which as often as the Insect fetch'd Breath, did alternately rise and fall again. On the 26th of *August*, one of these, according to the usual Metamorphosis of *Caterpillars*, became the *Aurelia*, *Fig. 17.* on a Vine-Leaf, prettily twisted and folded up; and on the 15th Day of *September*, that beautiful Autumnal Fly (*Fig. 16.*) came from it, of a green Colour, with six white Spots on the upper part of its Body, and two on each side toward the Tail. The under Wings were finely painted with a curious sky and red Colour, with a broad Border of pale yellow. This Insect is furnish'd with a very long, and remarkable *Proboscis*, or Trunk, with which it sucks the Juice of the Grape, and very dextrously fastens it in each Bunch; which is the Food it most delights in, as does the *Caterpillar* in the Leaf of the Vine.

Fig. 16.



Aurelia Fig. 17.





Fig. 19.

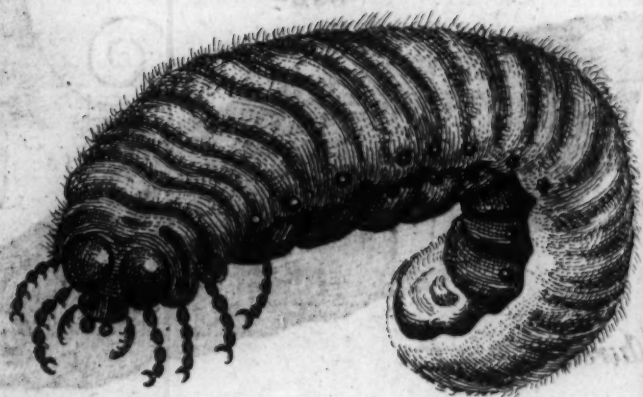


Fig. 18.

crav
of t
notv
Flow
Apr
lyin
in a
the
chan
were
Hou
chan
here
deep
The
unto
lours.

Fig. 18. This Worm, or *Caterpillar* was found crawling on the Root of the white *Battattes*; a Fruit of the Earth growing naturally about *Surinam*, which notwithstanding are not eat: It produces a fine white Flower. By digging in a Garden in the Month of *April*, some of these *Caterpillars* were discover'd lying at the Root of a *Battattes*, wrapp'd up in a narrow Compafs: One of these had juft put on the form of a beautiful *Chaffer*; others were lefs changed, but approaching to the fame. All as yet were manifefly foft, and whitifh; but in a few Hours after growing hard, they were all gradually changed into fuch a kind of painted *Chaffer* as is here represented *Fig. 19.* flying, which was of a deep green, a crimfon, with Stripes of yellow, &c. The Wings of which appear'd in Colour much like unto a beautiful Tulip, variegated with curious Colours.

Fig.

Fig. 20. This Insect, called in Dutch *bel Wandelende Blad*, as being a sort of Locust; though *Merian* calls it a *Glo-worm*; is bred from an Egg, which after natural Conjunction the Female lays in that place, in which afterwards the young Creatures to be produced can get their Food at hand; (a provident Instinct implanted in the Parents of most, if not all Insects.) First these little Creatures become *Worms*, or *Caterpillars*; which feeding grow and increase; and when come to a complete bigness, they spin their Webs, and are transformed into *Aurelia's*: some of which want a shorter, some a longer time to attain their full vigor: All of which at last come out of their Shells, and break forth moist, and their Wings very much twisted; but sometimes their Wings grow dry, and are expanded in less than half an Hour, after they have stirr'd and shaken themselves a little: so that they appear in every respect perfect as represented in the Figure: which being thus chang'd, seem ten times larger than the *Aurelia's* in which they were just now shut up.

Fig. 21. Is a kind of Locust found in the *Indies*: *Merian* says, her Negro, whom she charg'd to search for Worms, Caterpillars, and other little Creatures, every where in the Woods; brought her a Leaf wrapp'd up, which being carefully open'd, presented to her sight green Eggs, as big as *Coriander Seed*; from which, in a few Days after, little black Creatures like small *Pismires* were hatch'd; which grew by degrees till they arriv'd to their full bigness, as the Figure shews: without being changed into *Aurelia's*, as the *Glo-worms* are, but by the Growth and Increase of their Parts only. Their Wings are like a green Leaf, strengthen'd with such-like Fibres. There are several sorts of these Insects that differ in Colour: Some are of a bright green, others of a duller green, and others again of various and ash Colour: Besides there are some to be met with, whose Wings look like dried Leaves. Ignorant People have thought these little Creatures themselves sprung

Fig: 20.



Fig: 21.

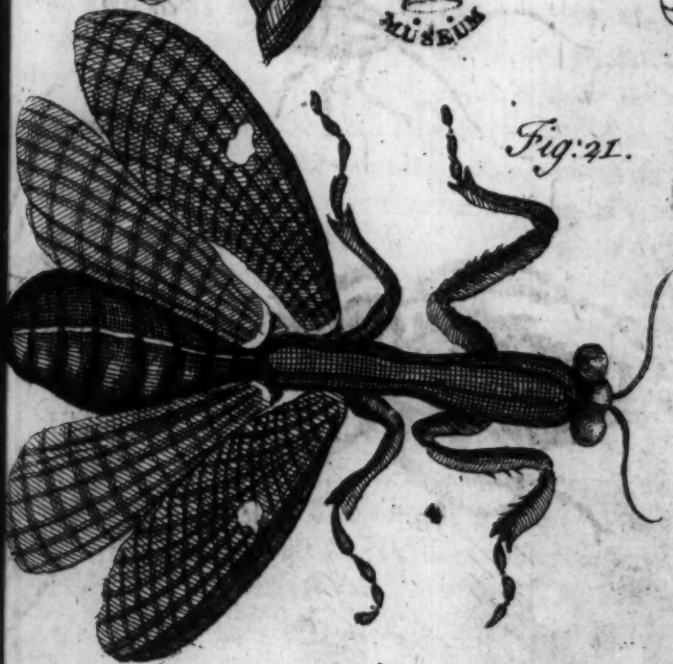


Fig. 24.

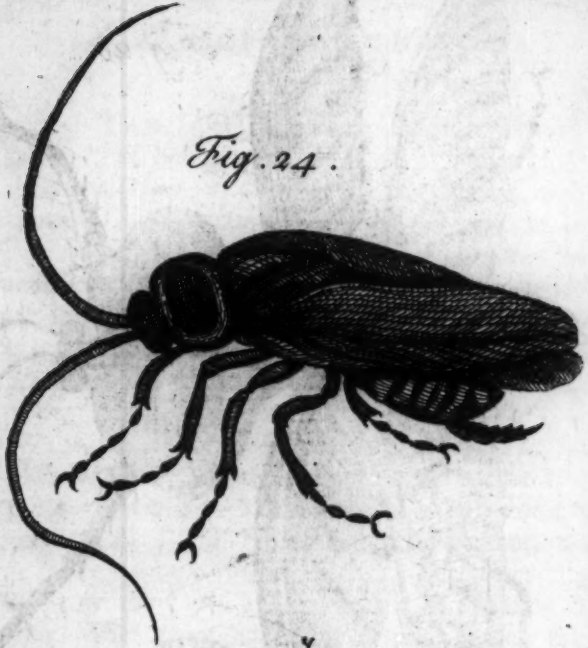


Fig. 22

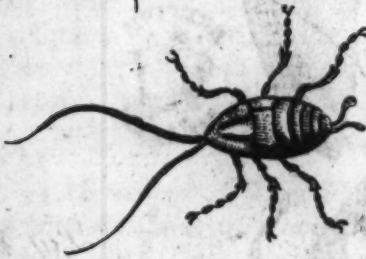
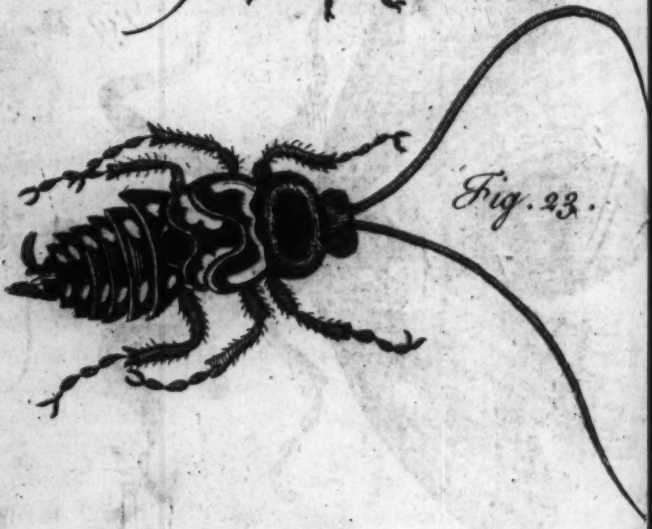


Fig. 23.



spr
bec
a l
the
Inf
Inh
Wo
Dri
Foc
the
of
Th
the
mar
hate
thei
ture
they
the
Che
gna
gro
of a
ing
shar
with
the
it st
Back
is th
tend
Hea
the

ANIMALS and VEGETABLES. 61

sprung from the Tree where they spin their Webs, because their Wings are green, and have the form of a Leaf.

Fig. 22. The COCK-ROCH, or as *Merian* calls them the *Kakkerlaca*, are the most remarkable of all Insects in *America*; because they every where do the Inhabitants the greatest Damage, by destroying their Wollen and Linnen, and spoiling their Victuals and Drink: All manner of sweet things are their beloved Food; for which reason they are much delighted with the *Ananas*, or Pine-Apple, which for the richness of its Flavour, is justly call'd the *King* of Fruits. These Insects lay their Eggs up in Heaps, which they wrap all round in a Bag, or Web, after the manner of some Spiders: When their little Eggs are hatch'd, and the young ones quite perfect, they break their Egg-shells with gnawing; and the little Creatures run out with prodigious nimbleness: and as they are no bigger when first hatch'd than Ants, they creep thro' Cracks and Key-holes, into Boxes, Chests, &c. with all the ease imaginable, where they gnaw and spoil all they can come at: till at last they grow to the bigness of the Figure 23. in the Plate, of a reddish brown Colour, mark'd with white: having two very long Horns; six hairy Legs, with two sharp Claws at their ends, like Forks: the Head black, with a reddish Circle round the upper part. When the Creature is arrived to this bigness, or full Growth; it sheds or casts its Skin; which Skin bursting on its Back, comes forth the *Cock-roch*, Figure 24. which is the Insect in its perfect State; with Wings soft and tender, at first whitish, after of a reddish Colour: The Head, Horns, Legs, &c. both in shape and colour the same as before the Insect cast its Skin. Its Shell

or cast Skin remaining, preserv'd its primitive Form of an Insect.

Fig. 25. Is a large SPIDER seizing on the Humming-Bird. Of these kind of Spiders, *Merian* tells us, she found many on the *Guajava* Tree, in which they make Nests, representing a *Caterpillar's* Web: Their Bodies are cover'd all over with Hair: they are besides furnished with sharp-pointed Teeth, with which they give dangerous Wounds; infusing some liquid Matter from them at the same time. *Pismires* are their common Food; in scarcity of which they take the young Birds out of their Nests, and suck all the Blood out of their little Bodies. The *Humming-Bird* that this *Spider* preys on, is thought to be the least of all Birds; the Body, together with the Feathers, is scarce equal in bigness to a *Spanish* Olive: They are very richly beautified with various Colours, wonderfully resplendent, being finer than the very Peacock himself, (see Page 19.) It makes its Nest in the Boughs of Trees, of the bigness of an *Holland* Schilling; and lays very white Eggs, two for the most part, of an oval Figure, not bigger than Pease. These Birds fly very swiftly, and suck Honey from the sweet Flowers with their Wings expanded; that they hang in the Air as it were motionless. In flying this little Bird makes a Noise like a Hornet, or Bee; hence it took its Name in *English*, of *Humming-Bird*. *Merian* says, she was told these Birds are the Food of the Priests of *Surinam*, who are forbid to eat any other Meat. Those kind of large *Spiders*, (*Fig. 25.*) shed their Coats now and then, just as *Caterpillars* do, but are not observ'd to change into the flying Kind.



Fig. 26. *A Large Spider seizing
on the Humming Bird*

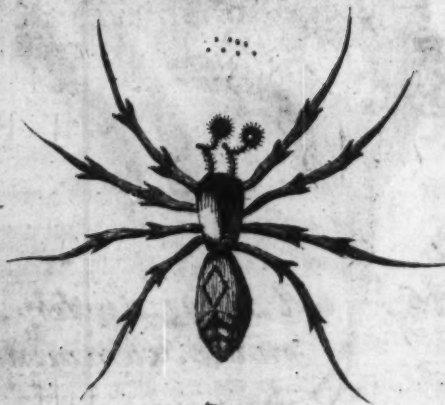


Fig. 26. This small *Spider* was of a scarlet Colour: It was found in a *Wood* at the beginning of *June*. They are likewise found in *Gardens* on the Bodies of *Trees*; but are something smaller than those found in the *Woods*. These *Spiders* are accounted venomous; and are the only Species of the Spider Kind that are accounted so, excepting the *Tarantula*; *Spiders* being more frightful than prejudicial to Mankind. This Spider, and all the rest describ'd in this Book, are drawn from the Life, and are of the natural bigness of the *Spiders* themselves.

Fig. 27. Is a *Spider* very remarkable for its Legs and Feelers; each Joint of the former appears as if it were plac'd in a Socket; the latter were globular and hairy; and on the outer side of each, there was a bright knob of white, incircled with yellow, which made it look as if a little Stone had been set therein. It had eight Eyes, standing as they are placed over the *Spider* in the Plate. This is a Male Spider, and was taken in a House in the Month of *April*: Its Colour was black where the Eyes stood; the other part adjoining to the Belly was of a reddish chefnut; the upper side of the Belly of a yellowish dark ash Colour; and the Legs of a reddish Colour.

Fig. 28. Is one of the *Six-ey'd Spiders*: It was taken in a *Wood* in the Month of *April*. It was of a dark Colour, with a broad Streak of light hair Colour in the middle of its Back; and a mark of the same light Colour, in the form of a Diamond, on the upper part of its Belly: The Legs were finely spotted. One of these *Spiders* was taken at the beginning of *June*, with its Egg-bag under its Belly.

Fig. 29. The small *Long-legg'd Spider* was so finely mark'd, that it is impossible to describe it, either in Words or Colours; there being so fine a Mixture of green, red, and black interchangeably put together in pretty Shapes; the Legs were also curiously mark'd in the same manner: The Eyes were so small as not to be discerned. It was taken on the Body of a Tree in *Cane-Wood*, about the middle of *April*.

Fig. 30. Is one of the *House-Spiders*: It had eight Eyes. Its Legs were finely spotted with black, and from each Joint grew certain Hairs or Bristles: Its Feelers were long and slender. The thick Web of this, and all the *House-Spiders*, may be made use of, in the Cure of all *Intermittent Fevers*.

Fig. 31. Is one of the *Jumping-Spiders*: It had eight Eyes placed in a circular form, as over the Head of the Spider in the Plate; and it is observable that all the Spiders that have their Eyes standing in that form, catch their Prey by jumping on it, like a Cat at a Mouse. It is a Creature extremely nimble in moving any way it pleases: 'twas taken in a Garden. If you look on it with a *Microscope*, it appears one of the most beautiful Spiders, that can possibly be seen; there is so great a Variety of Marbling, in pretty Figures of several Colours, *viz.* black, chesnut, reddish, and white mix'd all over the Back, Belly, Legs and Feelers, as not to be express'd. It seems to the naked Eye to be a greyish speckled Spider, being all over rough and hairy. The late ingenious Dr. Hooke, in his *Micrography*, gives the following diverting Account of this particular Spider; as observ'd by the most accomplish'd Mr. Evelyn, in his Travels in *Italy*.

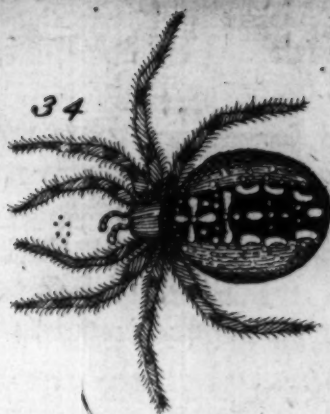
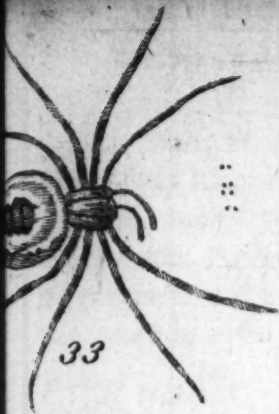
“ Of

" Of all the sorts of Insects, *says he*, there is none
 " has afforded me more Diversion than the small
 " grey *Jumping-Spider*, prettily bespeck'd with black
 " Spots all over the Body, which the Microscope dis-
 " covers to be a kind of a Feathers like those on But-
 " terflies Wings, or the Body of the white Moth. It
 " is very nimble by Fits, sometimes running, and
 " sometimes leaping, like a Grasshopper, then stand-
 " ing still, and setting itself on its hinder Legs, will
 " very nimbly turn its Body, and look round it self
 " every way. Such, says Mr. *Evelin*, I did frequent-
 " ly observe at *Rome*, which espying a Fly at three
 " or four Yards distance, upon the Balcony where I
 " stood, would not make directly to her, but crawl
 " under the Rail, till being arriv'd right under her,
 " it would steal up, seldom missing its Aim: but if
 " it chanced to want any thing of being perfectly
 " opposite, would, at first Peep, immediately slide
 " down again, till taking better notice, it would
 " come the next time exactly upon the Fly's Back:
 " but, if this happen'd not to be within a competent
 " Leap, then would this Insect move so softly, as
 " the very Shadow of the Dial seem'd not to be
 " more imperceptible, unless the Fly mov'd; and
 " then wou'd the Spider move also in the same pro-
 " portion, keeping that just Time with her Motion,
 " as if the same Soul had animated both those little
 " Bodies; and whether it were forwards, backwards,
 " or to either side, without at all turning her Body,
 " like a well-managed Horse: But if the capricious
 " Fly took wing, and pitch'd upon another Place
 " behind our Huntress, then would the Spider whirl
 " its Body so nimbly about, as nothing could be ima-
 " gin'd more swift; by which means, she always kept

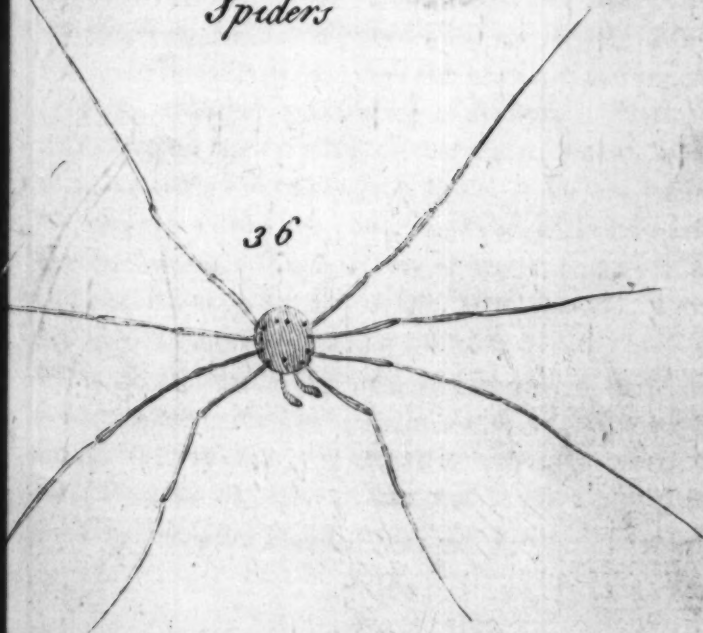
“ the Head towards her Prey, tho’ to appearance as
 “ immovable, as if it had been a Nail driven into the
 “ Wood, till by that indiscernible progress, being ar-
 “ riv’d within the Sphere of her reach, she made a
 “ fatal Leap (swift as Lightning) upon the Fly, catch-
 “ ing him in the Pole, where she never quitted hold
 “ till her Belly was full, and then carried the Re-
 “ mainder home. I have beheld them instructing
 “ their young ones how to hunt, which they would
 “ sometimes discipline for not well observing; but
 “ when any of the old ones did miss a Leap, they
 “ would run out of the Field, and hide themselves in
 “ their Crannies, as aham’d, and not be seen abroad
 “ for four or five Hours after: for so long have I
 “ watched the Nature of of this strange Insect, the
 “ Contemplation of whose so wonderful Sagacity and
 “ Address has amaz’d me; nor do I find in any Chase
 “ whatsoever, more Cunning and Stratagem observ’d.
 “ I have found some of these Spiders in my Gar-
 “ den, when the Weather towards the Spring is very
 “ hot, but they are nothing so eager of Hunting as
 “ they are in *Italy*.

The *Spider* Fig. 32. was beautifully streaked, and
 speckled with black all over its Body and Legs. It
 had eight Eyes, standing as they are expressed over
 the Spider in the Plate: At the End of its Tail there
 were little short things like Feathers standing up,
 which it opened and shut like a Fan at pleasure. It
 was taken in a Chamber-Window, about the middle
 of *July*.

Fig. 33. Was taken closed up in a Leaf, near to a
 Web it had made. It had eight Eyes: The Back
 and Legs of this Spider looked transparent, like clear
 Horn: The



Spiders





The Spider Fig. 34. was curiously and regularly mark'd with Lines and Spots of white; the Legs were yellowish and very hairy, and spotted with dark brown; the Feelers were also spotted. It had six Eyes placed as they are expressed in the Plate. It was found in a Garden, at the latter End of July.

The Spider Fig. 35. was of a Hair-colour, mark'd with a Spot and broad Line of yellow: The upper side of the Belly had a Mark in the shape of a Cross, of a yellow Colour: The Legs were of a light Hair-colour spotted with black, having Bristles of the same Colour on the Joints. It had six Eyes standing as they are plac'd in the Plate. It was found in a Web in *Bishops-Wood*, at the Beginning of September.

Fig. 36. The Carter, or Long-legg'd Spider, for two Particularities has very few Creatures like it; the first, which is discoverable only by the Microscope, is the curious Contrivance of his Eyes, of which he has only two, and those placed upon the top of a small Pillar or Hillock, rising out of the middle of the top of its Back, or rather the Crown of its Head; for they were fixed on the very top of this Pillar, placed back to back, with the transparent Parts, or Pupils, looking towards either side, but somewhat more forward than backwards. These Eyes, to appearance, seem'd to be of the very same Structure with that of larger two-ey'd Creatures, seeming to have a very smooth and very protuberant Cornea, and in the midst of it to have a very black Puple, incompass'd about with a kind of grey Iris. Whether it were able to move these Eyes to and fro, I have not observ'd; but 'tis not very likely he should, the Pillar or Neck seeming to

to be cover'd and stiffen'd with a crusty Shell; but Nature, in all probability, has supply'd that Defect, by making the Cornea so very protuberant, and setting it so clear above the shadowing or obstructing of its Prospect by the Body, that 'tis likely each Eye may perceive, though not see distinctly, almost an Hemisphere; whence having so small and round a Body, placed upon such long Legs, it is quickly able so to wind, and turn it, as to see any thing distinct. This Creature, as do all other *Spiders*, differs very much from most Insects in the Figure of its Eyes; for the best Microscope does not discover its Eyes to be any ways knobb'd or pearl'd, like those of other Insects. The second Peculiarity which is obvious to the Eye, is also very remarkable, and that is the prodigious length of its Legs, in proportion to its small round Body, and which are jointed, just like those of a Crab, but every of the Parts are spun out prodigiously longer in proportion; each of these Legs are terminated in a small Case or Shell, shap'd almost like that of a Muscle-shell, fasten'd to the Body in so admirable a manner, as does not a little manifest the Wisdom of Nature in the Contrivance; for these long Leavers (as I may so call them) of the Legs, having not the advantage of a long end on the other side of the *Hypomocklion*, or Centers, on which part of the Legs move, must necessarily require a vast Strength to move them, and keep the Body balanc'd and suspended, insomuch, that if we should suppose a Man's Body suspended by such a Contrivance, an hundred and fifty times the strength of a Man would not keep the Body from falling on the Breast. To supply therefore each of these Legs with its proper strength, Nature has allow'd to each a large Chest or Cell, in which

which is included a very large and strong Muscle ; and thereby this little Animal is not only able to suspend its Body upon less than these eight, but to move it very swiftly over the tops of Grass and Leaves. This Creature seems to throw its Body upon the Prey, not unlike a Jumping-Spider. The whole Fa-
 brick, when view'd by the Microscope, appear'd a very pretty one ; and could it have been dissected, as many Singularities might have been found within it as without ; perhaps, for the most part, not unlike the Parts of a Crab, which this little Creature does in many things very much resemble. I omit the Description of the Horns, of the Mouth which seem'd like that of a Crabs ; the Speckledness of his Shell, which proceeded from a kind of Feathers, or Hairs, and the hairiness of his Legs, his large Thorax and little Belly, and the like, and shall only take notice, that the three Parts of the Body, namely the Head, Breast and Belly, are in this Creature strangely confus'd, so that 'tis difficult to determine which is which, as they are also in a Crab ; and indeed, this seems to be nothing else but an *Air-Crab*, being made more light and nimble, proportionable to the Medium wherein it resides ; and as Air seems to have but one thousandth part of the Body of Water, so does this Spider seem not to be a thousandth part of the Bulk of a Crab.

All kinds of *Spiders* seem to be Creatures of Prey, and to feed on other small Insects ; but their ways of catching them are very different : The *Shepherd Spider* by running on his Prey ; the *Jumping Spider* by leaping on it, other sorts weave Nets, or Cobwebs, whereby they insnare them ; Nature having both fitted them with Materials and Tools, and taught them
 how

how to work and weave their Nets, and lie perdue, and to watch diligently to run on a Fly as soon as entangled:

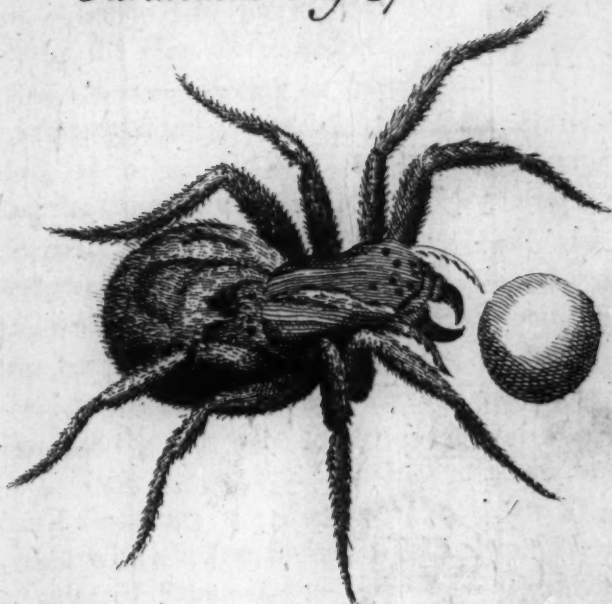
The *Foot of a Spider* is of an admirable and wonderful Mechanism, whereby he is able to spin, weave, and climb, or run on his curious transparent Clues. Mr. *Albin*, in his *Natural History of Spiders*, just published, has collected near *Two Hundred* different sorts of these Insects. Their Thread or Web seems to be spun out of some viscous kind of Excrement, lying in their Belly; which, tho' soft when drawn out, is presently, by reason of its smallness, harden'd and dried by the ambient Air.



Of the TARANTULA.

Fig. 37. IS the TARANTULA from *Bagliovi*; **Fig. 38.** from the *Natural Spider* in Sir *Hans Sloan's* Collection. This Insect is a Spider of *Apulia* in *Italy*, of the eight-ey'd Kind, and spins Webs: It has eight Legs, four on each side, and in each Leg three Joints; from the Mouth proceed two Darts, in shape just like to a Crab's Claws; these are solid, and very sharp, so that they can easily pierce the Skin; and between those and the fore Legs there are two little Horns, or Feelers; which it is observed to move very briskly when it approaches to its Prey.

This, as other Spiders do, propagates its Species by laying Eggs, which are very numerous; so that there are found sometimes in the Female, when dissected,

Tarantula Fig. 37.*Tarantula Fig: 38.*



lecter
partl
the
the
grea
amou
Pass
scare
mou
in t
first
a B
a li
infla
is s
ing
wit
Ail
and
He
I
app
fer
Pat
and
M
ou
at
the
be
at
de
th
for

affected, a hundred or more; and these are hatched partly by the Heat of the Mother, partly by that of the Sun, in about twenty or thirty Days time. In the Summer Months, especially when the Heats are greatest, as in the Dog-days, the *Tarantula* creeping among the Corn in the Fields, bites the Mowers and Passengers. In the Winter it lurks in Holes, and is scarcely seen; and if it does bite then, it is not venomous, neither does it induce any ill Symptoms. But in the hot Weather, altho' the Pain of its Bite is at first no greater than what is caused by the Sting of a Bee, yet the Part quickly after is discoloured with a livid, black, or yellowish Circle, and raised to an inflam'd Swelling; the Patient within a few Hours is seized with a violent Sicknes, Difficulty of Breathing, universal Faintness, and sometimes Trembling, with a Weakness of the Head; being asked what the Ail is, makes no Reply, or with a querulous Voice and melancholy Look, points to his Breast, as if the Heart was most affected.

During this mournful Scene, all the usual Medicines apply'd to venomous Bites, and Cordials, are of no service; for, notwithstanding their repeated use, the Patient growing by degrees more melancholy, stupid, and strangely timorous, in a short time expires; unless Musick be called to his assistance, which alone, without the help of Medicine, performs the Cure. For, at the first Sound of the Musical Instrument, altho' the Sick lie, as it were, in an Apoplectick Fit, they begin by degrees to move their Hands and Feet, till at last they get up, and fall to dancing with wonderful Vigour, at first for three or four Hours; then they are put to Bed, refreshed from their Sweating, for a short time, and repeat the Exercise with the same

same Vehemence, perceiving no Weariness or Weakness from it, but professing they grow stronger and nimbler the more they dance.

At this sport they usually spend twelve Hours a Day, and it continues three or four Days; by which time they are generally freed from all their Symptoms, which do nevertheless attack 'em again about the same time the next Year; and if they do not take care to prevent this Relapse by Musick, they fall into a Jaundice, want of Appetite, universal Weakness, and such like Diseases; which are every Year increased, if Dancing be neglected, till at last they prove incurable. As Musick is the common Cure, so they who are bitten are pleas'd, some with one sort of it, some with another; one is rais'd with a Pipe, another with a Timbrel; one with a Harp, another with a Fiddle; so that the Musicians make sometimes several Essays before they can accommodate their Art to the Venom; but this is constant and certain, notwithstanding this Variety, that they all require the quickest and briskest Tunes, and are never moved by a slow, dull Harmony.

While the Persons affected are Dancing, they lose in a manner the use of all their Senses; like so many Drunkards, do many ridiculous and foolish Tricks; talk and act obscenely and rudely; take great Pleasure in playing with Vine-Leaves, with naked Swords, and red Cloths, and the like; and on the other hand can't bear the sight of any thing black; so that if any By-stander happen to appear in that Colour, he must immediately withdraw, or otherwise they Relapse into their Symptoms with as much Violence as ever.

Peak-
and

rs a
hich
mp-
bout
take
into
nefs,
reaf-
rove
they
f it,
ano-
with
eve-
rt to
with-
tick-
by a

lose
any
cks;
'lea-
rds,
and
t if
he
Re-
e as
It



Fig. 41. American Ants

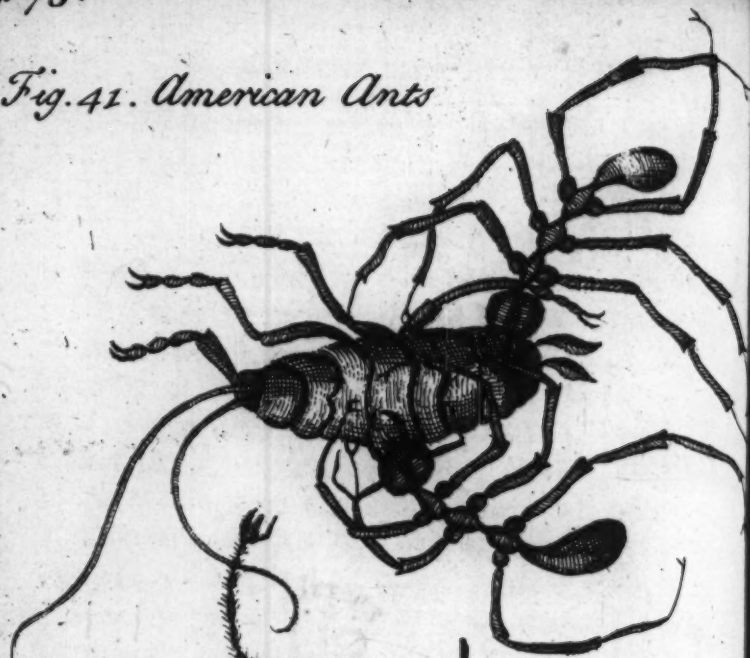


Fig. 40. Wood Ant Magnified

the
the
in
pe
the
ou
dr
lea
wi
Ph
acc
all
Sy
ex
the

Fig

Ant
roch
dust
to,
wh
star
suffi
Nee
ty
says
long
up,
Gro
after
serv

It may afford some Light towards understanding the Nature of this Poison, to observe that *Apulia* is the hottest Part of all *Italy*, lying Eastward, and having all the Summer long but very little Rain to temper the Heats; so that the Inhabitants, as one of that Country observes, do breathe an Air, as it were, out of a fiery Furnace: Hence their Temperament is dry, and adust, as appears by their being generally lean, passionate, impatient, ready to Action, quick-witted, very subject to inflammatory Distempers, Phrensies, Melancholy, and the like; upon which account there are more mad People in this, than in all the other Parts of *Italy*. As to the return of the Symptoms the next Year, that is owing to the same excessive Heat in those Months, acting again upon the small Remains of the venomous Ferment.

Fig. 39. **I**S the Large WOOD-ANT; Fig. 40. the same Magnified; Fig. 41. the *American Ants*, as described by *Merian*, seizing on a Cockroach. This little Animal is that great Pattern of Industry and Frugality that *Solomon* sends the Sluggard to, that he may learn by the Example of the *Ant*; who borrows of none, and yet is not in danger to starve; laying up in store, by a notable Diligence, sufficient Provision in due Season against a time of Need. Dr. *Hooke*, in his *Micrography*, has some pretty Observations on this little Creature. The *Ant*, says he, is of a dark brown, or reddish Colour, with long Legs, on the hinder of which it would stand up, and raise its Head as high as it could above the Ground, that it might stare the further about it, just after the same manner as the *Hunting-Spider* is observ'd to do: and putting my Finger towards them,

H

they

they have at first all run towards it, till almost at it; and then they would stand round about it, at a certain distance, and smell, as it were, and consider whether they should any of them venture any further; till one more bold than the rest venturing to climb it, all the rest, if I would have suffered them, would have immediately followed: Many such other seemingly rational Actions I have observ'd in this little Vermin, with much Pleasure. I have observ'd a very large Kind, that inhabited under the Roots of a Tree, from whence they would sally out in great Parties, and make most grievous Havock of the Flowers and Fruits, in the ambient Garden, and return back again very expertly, by the same Ways and Paths they went. It has a large Head, at the upper end of which were two protuberant Eyes, pearl'd like those of a Fly, but smaller: Out of the Nose, or foremost Part, issued two Horns, differing from those of a blue Fly, though indeed they seem to be both the same kind of Organ, and to serve for a kind of Smelling: Beyond these were two indented Jaws, which he open'd sideways, and was able to gape them asunder very wide; and the ends of them being armed with Teeth, which meeting went between each other, it was able to grasp and hold an heavy Body, three or four times the Bulk and Weight of its own Body. It has only six Legs, shap'd like those of a Fly, which is an Argument that it is a winged Insect; and though I could not perceive any sign of them in the middle part of its Body, which seem'd to consist of three Joints or Pieces; yet 'tis known that there are of them that have long Wings, and fly up and down in the Air. The whole Body was cas'd over with a very strong Armour, and the Bel-

ANIMALS and VEGETABLES. 73

ly was covered likewise with Multitudes of small white shining Bristles; the Legs, Horns, Head, and middle Parts of its Body were bestuck with Hairs also, but smaller and darker. In *America*, as *Merian* writes, there are very large *Ants* or *Pismires*, which will in one Night strip whole Trees of their Leaves. They have two crooked Teeth, cutting one upon another, like a Pair of Pincers; by means of these, they cut the Leaves of the Trees so that they fall to the Ground, and the Tree looks bare and naked; just as it looks in the Winter in *Europe*: Thousands of *Ants* waiting for this Booty, catch up the Leaf as it falls on the Earth, to carry to their Homes; not so much for their own Food as their young ones, as yet but little Worms. This whole Proceeding seems, as if it were, done by a mutual Agreement amongst themselves; that one Party should go up in the Tree to cut the Leaves, whilst the other bears an equal share of the Labour in carrying them to their Cells. These *Ants*, when they are arriv'd to their full Growth, shed their Coats, or Skins, in like manner as do some other of the Insect Kind; and become winged: In this state they lay their Eggs just as the Gnats do; which are afterwards hatch'd into little Worms, or Mites; and for the Preservation of this their Offspring it is, that the provident *Ants* are so eager and vigilant to feed and nourish them: So great is their Concern in this particular, as appears by their indefatigable Toil, that they may very justly be esteem'd as great Patterns of Tendernefs and Care of their Young, as they are for Industry and good Economy. These industrious little Creatures make Caverns in the Earth of a great Depth, so artificially contriv'd, that one would affirm it to be a

piece of Man's Ingenuity. These *Ants*, they say, have a perpetual Enmity with the Spiders, and all other Insects of that Country, in the *West-Indies*, where they are found. When they fall out of their Caverns, which they do once a Year, an innumerable Multitude of them comes forth, which enter Peoples Houses, range from one Room to another; and kill divers small Creatures they meet with, by sucking them to Death; that large Spider, *Page 62.* was destroy'd by this means in a Moment almost; it was beset with such Heaps of 'em, that it cou'd not disengage, and free itself from Danger; 'tis said, that even Men themselves must fly for it, they make their way so in Troops from one Room to another; and having ranack'd, and as it were swept the whole House, they make to the next; till at last, they go back again to their Holes.

Fig. 42. Is the *Blue FLY* in its natural bigness; *Fig. 43.* the same Magnified. This kind of Fly is a very beautiful Creature, and has many things about it very notable. The Head, Eyes, Wings, and Feet, are full of Ornaments and Contrivances; and afford no less pleasing an Object to the Mind to speculate upon, than to the Eye to behold; there is a most admirable and curious Mechanism in the Foot of this little Animal; whereby the Flies are enabled to walk against the sides of Glass, perpendicularly upwards, and to contain themselves in that Posture as long as they please; nay, to walk and suspend themselves against the under Surface of many Bodies, as the Cieling of a Room, or the like; and this with as great a seeming Facility and Firmness, as if they had a natural Tendency upwards, as we are sure they have

Fig. 43.
Blue Fly





have
so I
unde
their
some
wha
refer
whe
curi
All
ver
ing
that
very
tles,
by
so a
bigg
avoi
swif
it fe
may
hard
duri
mer
One
ly f
gan
and
ing
glafs
been
ter
Eye

have the contrary; for they cannot make themselves so light, as to stick or suspend themselves on the under Surface of a Glass well polished and cleansed; their Suspension therefore is wholly to be ascrib'd to some mechanical Contrivance in their Feet; which what it is, being too long for my present Design, I refer the ingenious Reader to *Hooke's Micrography*, where this particular, as well as some others no less curious, are largely and philosophically treated of. All the hinder part of the Body of this Fly, is cover'd with a most curious blue shining Armour, looking exactly like a polished piece of Steel, brought to that blue Colour by Annealing; all which Armour is very thick bestuck with abundance of tapering Bristles, such as grow on its Back, as is visible enough by the Figure. It is a Creature active and nimble, so as there are very few Creatures like it, whether bigger or smaller, insomuch that it will scape and avoid a small Body, tho' coming on it exceeding swiftly; and if it sees any thing approaching it which it fears, it presently squats down, as it were, that it may be the more ready for its rise. Nor is it less hardy in the Winter, than active in the Summer, enduring all the Frosts, and surviving till the next Summer, notwithstanding the bitter cold of our Climate. One of these put in Spirit of Wine, was very quickly seemingly kill'd, and both its Eyes and Mouth began to look very red; but upon the taking it out, and suffering it to lie three or four Hours, and heating it with the Sun-beams cast through a Burning-glass, it again reviv'd, seeming, as it were, to have been all the intermediate time dead Drunk, and after certain Hours to grow fresh again and sober. The Eyes of a Fly are placed in two Clusters; and

the number of the Pearls or Hemispheres in the Clusters of a Drone Fly, according to Dr. *Hooke's* Calculation, with the help of a Glass, was near fourteen thousand: which he judged by numbering certain rows of them several ways, and casting up the whole Contents, accounting each Cluster to contain about seven thousand; three thousand of which were of a larger size, and four thousand to be the number of the smaller Pearls. Tho' this may seem strange, other Insects, *he says*, he has observ'd to have yet a greater number of Eyes, as the Dragon-Fly, or Adderbolt. In living Flies, he has observ'd, that when any small Mote or Dust, which flies up and down the Air, chances to light upon any part of these knobs of the Eyes, as it is sure to stick firmly to it and not fall, the Fly presently makes use of his two fore Feet, instead of Eye-lids, with which, as with two Brooms or Brushes, they being all bestuck with Bristles, he often sweeps or brushes off whatever hinders the Prospect of any of its Hemispheres; and then, to free his Feet from that Dirt, he rubs them one against the other, cleansing them in the same manner as I have observ'd those that card Wool to cleanse their Cards, by placing their Cards so as the Teeth of both look the same way, and then rubbing them one against another. In the very same manner do they brush and cleanse their Bodies and Wings: Other Creatures have other Contrivances for the cleansing and clearing their Eyes.



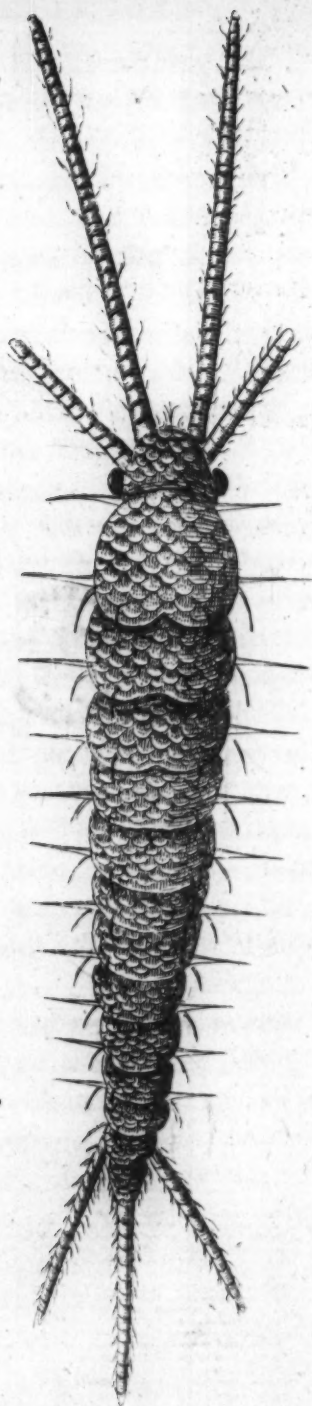


Fig. 44.
Book-worm

Fig. 44. Is the small silver-colour'd Book-Worm, Magnified. As among greater Animals there are many that are scaled, both for Ornament and Defence, so are there not wanting such also among the lesser Bodies of Insects, whereof this little Creature gives us an Instance. It is a small white silver-shining Worm or Moth, found much conversant among Books and Papers; and is suppos'd to be that which corrodes and eats Holes through the Leaves and Covers: It appears to the naked Eye, a small glittering Pearl-colour'd Moth, which upon the removing of Books and Papers in the Summer, is often observ'd to scud, and pack away to some lurking Cranney, where it may the better protect itself from any appearing Dangers. Its Head appears big and blunt, and its Body tapers from it towards the Tail, smaller and smaller, being shap'd almost like a Carrot. The Body is divided into fourteen several Partitions, being the appearance of so many several Shells, or Shields that cover the whole Body; every of these Shells are again covered or tiled over with a multitude of thin transparent Scales, which, from the multiplicity of their reflecting Surfaces, make the whole Animal appear of a perfect Pearl-colour. This Insect was furnish'd on either side of its Head with a Cluster of Eyes; and each of these Clusters were beset with a row of small Bristles, much like the *Cilia* or Hairs on the Eye-lids; and, perhaps, they serv'd for the same purpose. It had two long Horns; curiously ring'd or knobb'd, having at each knob small Hairs, or Bristles, here and there dispers'd among them: besides these, it had two shorter
Horns,

Horns, or Feelers, which were knotted and fring'd, just as the former. It had three Tails, in every particular resembling the two longer Horns that grow out of the Head. The Legs of it were scal'd and hair'd just like the rest, but are not express'd in this Figure, the Creature being intangled all in Glue, and so the Legs of this appear'd not through the Glasse, which looked perpendicularly upon the Back. The Body is beset with sharp-pointed Bristles, like Spears. Dr. *Hooke* says, This Animal probably feeds upon the Paper and Covers of Books, and perforates in them several small round Holes. Mr. *Albin* calls it the *Cloth Worm*, or Moth, and says it is the very Creature that eats the woollen Cloth; and that it is produced from a small grey speckled Moth that flies a-nights, and creeps in among woollen Cloths, and there lays her Eggs, which are hatch'd in their Season by the natural Heat of the Woollen; upon which these little Creatures feed, till they change into a flying Insect like their Animal Parent. To prevent the Havock that this little Creature (which is one of the Teeth of Time) is wont to make among woollen Cloths, &c. They should sometimes be air'd and brush'd, before the warm Season comes on for the Eggs to hatch, which will absolutely destroy the Eggs, and preserve the Garments.



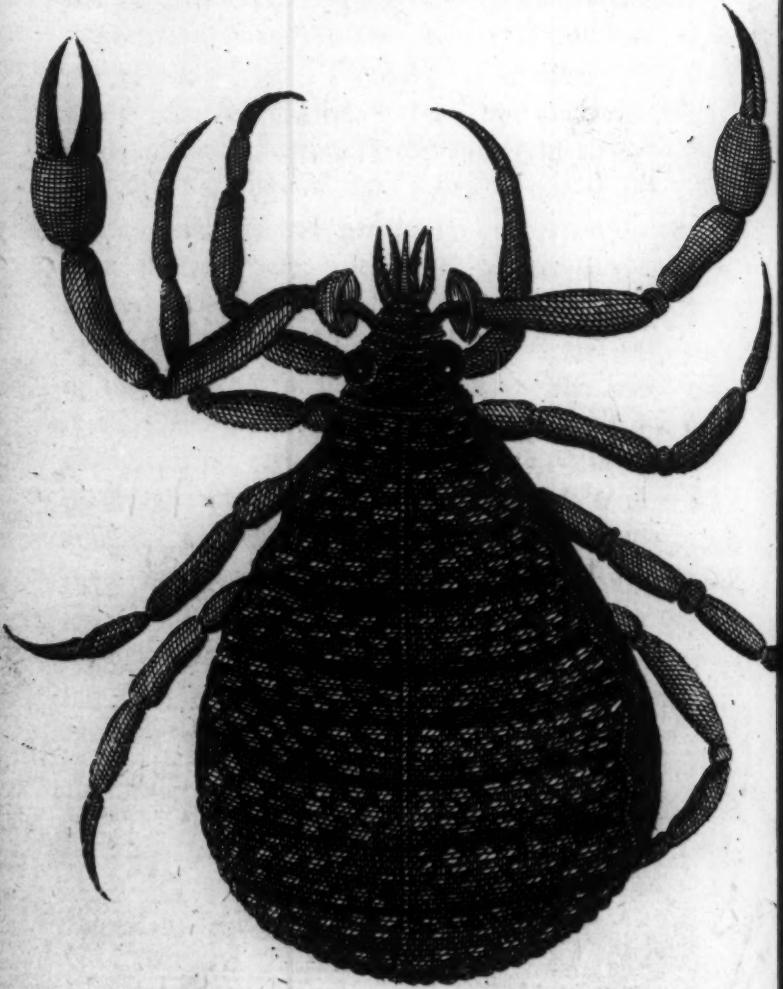


Fig. 45. Book-spider

Fig. 45. Is the *Crab-like Insect*, or BOOK-SPIDER. Reading one Day in *September*, I chanced to observe a very small Creature creep over the Book I was reading, very slowly; having a Microscope by me, I observ'd it to be a Creature of a very unusual Form, and that not less notable, as the Figure represents. Its natural bigness was about the size of a large Mite, or somewhat longer; it had ten Legs, eight of which were topt with very sharp Claws, and were those upon which he walk'd, seeming shap'd much like those of a Crab, which in many other things also this little Creature resembled; for the two other Claws, which were the foremost of all the ten, were exactly form'd in the manner of Crabs or Lobsters Claws; which this little Animal did open and shut at pleasure: It seem'd to make use of those two Claws both for Feelers and Holders; for in its motion it carried these aloft extended before, moving them to and fro, just as a Man blind-folded would do his Hands, when he is fearful of running against a Wall; and if I put an Hair to it, it would readily take hold of it with these Claws, and seem to hold it fast. The whole Body was cas'd over with Armour-shells, as is usual in all those Kinds of *crustaceous* Creatures, especially about their Bellies, and seem'd of three kinds; the Head seem'd cover'd with a kind of scaly Shell, the Thorax with two smooth Shells, or Rings; and the Belly with eight knobb'd ones. I could not certainly find, whether it had under these last Shells any Wings, but I suspect the contrary; for I have not found any wing'd Insect with eight Legs, two of those Legs being
always

always converted into Wings; and, for the most part, those that have but six, have Wings. This Creature, though I could never meet with more than one of them, and so could not make so many Examinations of it as otherwise I would, I did notwithstanding, by reason of the great Curiosity that appear'd to me in its shape, delineate it, to shew that, in all likelihood, Nature had crowded together into this very minute Insect, as many, and as excellent Contrivances, as into the Body of a very large Crab, which exceeds it in Bulk, perhaps, some Millions of times. It being a general Rule in Nature's Proceedings, that where she begins to display any Excellency, if the Subject be further search'd into, it will manifest, that there is not less Curiosity in those Parts which our single Eye cannot reach, than in those which are more obvious. [*Hooke's Microgr.*]

Fig. 46. The WEVIL, or CORN-BEETLE;
Fig. 47. the same Magnified. This little Creature was all over of a fine reddish brown Colour. Upon the Head, and upper part of the Body adjoining; and likewise upon the lower part of its Wings, were regularly placed divers black Spots, encircled with a resplendent white, shining like Silver, and a small Speck of the same silver Colour, plac'd exactly in the middle of each of those black Spots: It had a very remarkable *Proboscis*, or Trunk, long, and oddly shap'd, furnish'd with a Pair of sharp Forceps. Out of the end of this Trunk, the little Creature blow'd a small white, shining Bladder; with which it moistens the Corn before it eats it: This Bladder the Insect cou'd put out or draw in at pleasure, as might
be

Fig. 47.
Corn Beetle magnified



Fig. 46.
Weevil, or Corn Beetle



Fig: 48.
American Frog



Fig: 49. Water Beetle



be very plainly observ'd by the *Microscope*. Its Horns or Feelers were knobb'd, as if they were turn'd by a Turner, tipt at the ends with white, shining like Silver. These Insects feed upon almost all kind of Grain; amongst which they breed, and do very great Damage, especially if the Corn be kept any considerable time. Such Ships as go long Voyages often experience this; it being very common to have their Corn over-run with the *Weevils*. Though this little Animal in its natural bigness scarce equals a Grain of Wheat, yet the *Microscope* discovers it to be a Creature of great Curiosity, in the Frame and Structure of its Parts; as the Figure expresses, which was taken from the Life, and therefore not unworthy of a Description.

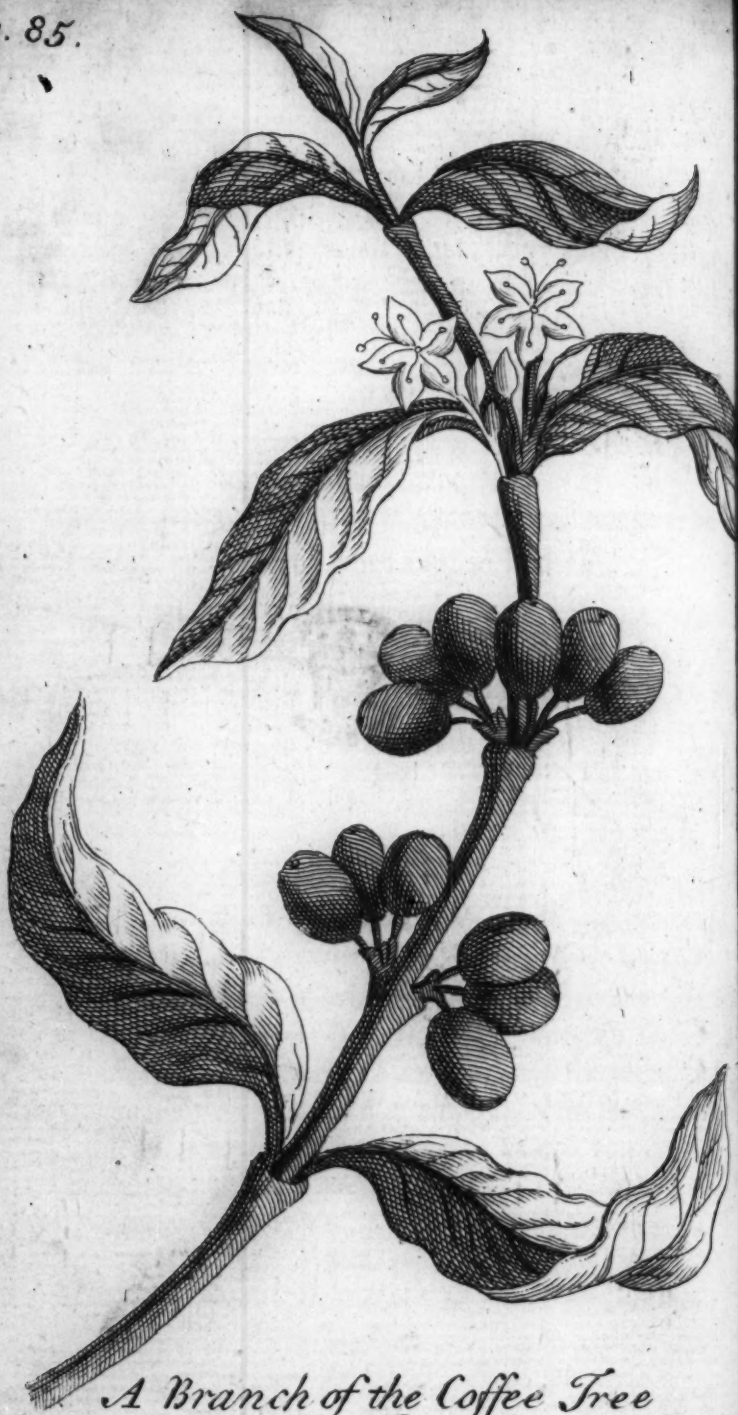
Fig. 48. Of these kind of FROGS, *Meriana* says, she saw several swimming in the Water at *Surinam*. Their Feet was furnish'd with a little Ball at the end of each Toe, by the singular Contrivance of Nature; that being so supported, they could not only swim, but also walk over the marshy and muddy Waters: They are of a brown, and pale green Colour intermixed together, as if they were water'd with it. These *Frogs* leave their Spawn on the Banks of the Waters; where such Persons as are curious to observe the Change of these Creatures, gather it, and lay it in an earthen Vessel filled with Water, upon a green Turf, at the bottom: The Spawn or Seed appears as a blackish Point, inclosed in a kind of white Glue; in which it lives, and by degrees increases its Motion, till about the eighth Day; after that they have Tails, and the little things begin to swim in the Water,

ter, but they are shapeless young *Frogs*: In a few Days more their Eyes appear, and a little after their two hind Feet; the two fore Feet likewise coming out of the Skin in about eight Days more: After which their Tails being rotted, drop off; and the Creatures become four-footed, and compleat *Frogs*, often seen scampering out of the Waters on the Land. But we must observe, that both the Water, and the Turf that the Spawn is put into, must be shifted every now and then; and the little Creatures, as soon as ever we perceive them to move, ought to be nourish'd in the Water with a bit of Bread.

Fig. 49. Is a Water Insect that preys upon young Frogs, which the Inhabitants of *Surinam*, where it is found, call a WATER SCORPION: It seems to be rather of the Beetle kind; in the Month of *May* it changes to a flying Insect.

Having had occasion to make mention of Surinam, in some of the Descriptions of Insects; It may not be improper to inform the Reader, that Surinam is a Dutch Settlement in Guiana, upon the Continent of America. It first belonged to the French, who built a Fort there: from them the English took it; and afterwards the Dutch took it from the English; in whose Hands it now remains. Madam Meriana, a Gentlewoman of the Dutch Nation, (if I am rightly inform'd) publish'd a Natural History, with curious Figures, of the Insects, &c. found in and about Surinam, from which Book the Indian Flies contain'd in this Treatise are copied.





A Branch of the Coffee Tree



ON

Thy
fa
Spik
a
a



and
prop
ter
kept
not
has
for
sent
vate
hutel
But



B O O K the Fifth.

Of P L A N T S, F R U I T S, and F L O W E R S.

Thy Plants are an Orchard of Pomegranates, with pleasant Fruits, Camphire, with Spikenard; Spikenard and Saffron; Calamus and Cinnamon, with all Trees of Frankincense, Myrrhe and Aloes; with all the chief Spices.

SOLOMON'S Song, IV. 13, 14.

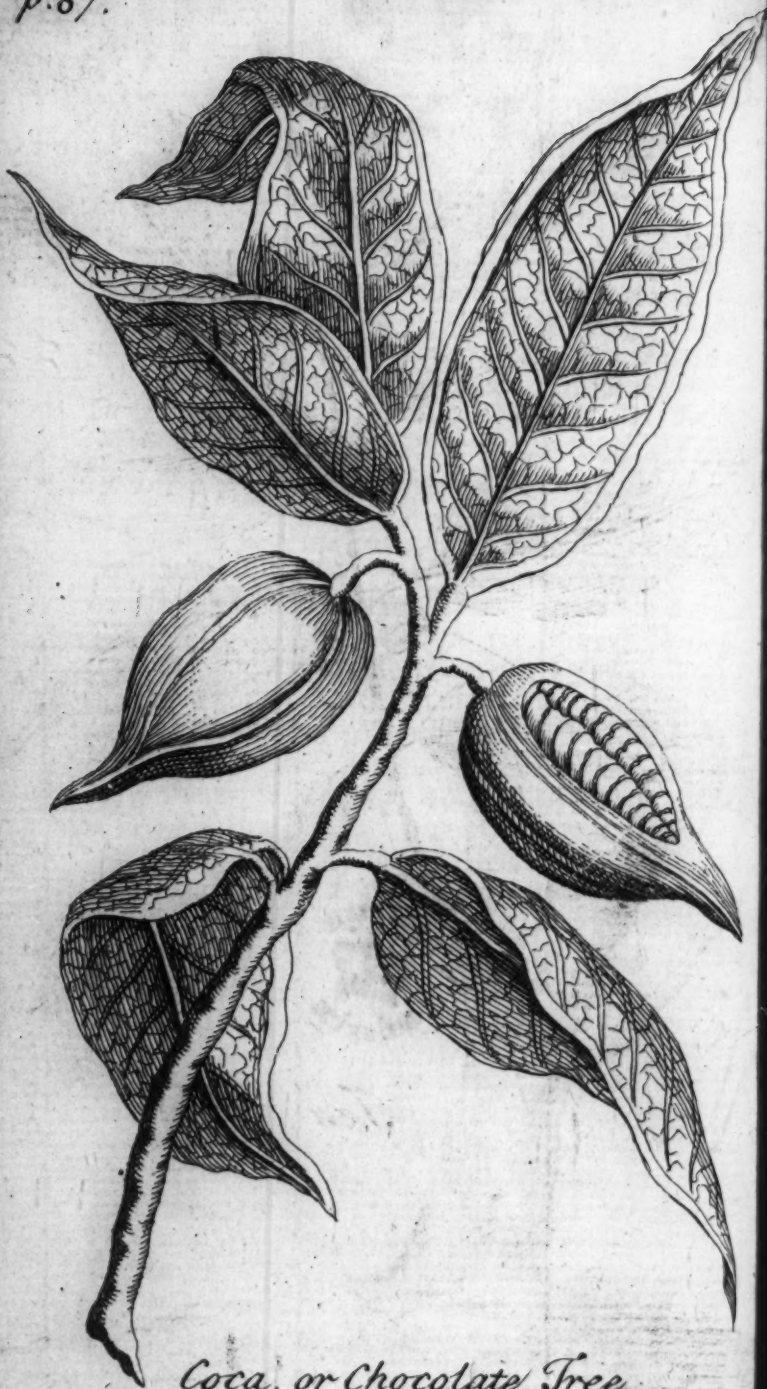
COFFEE is the Fruit of a Tree which grows in *Arabia Felix*, and is brought to us from *Mocha*. The Flower of this Tree is like the white *Jessamine* Flower, and the Leaf like the Bay-leaf. The *Coffee* Tree is propagated by Seeds, which shou'd be sown soon after they are gather'd from the Tree; for if they are kept but a short time out of the Ground; they will not grow; which is the chief Reason, that this Tree has not been spread into more different Countries: for the Seeds will not keep good long enough to be sent to any distant Place: So that in order to cultivate this Plant in any Part of the World, it is absolutely necessary to have it carried thither growing. But as this Difficulty is now overcome, by the quantity

tity of these Trees there are now growing both in *Europe* and *America*; so we may expect to be furnished with them from many different Parts, but especially from the *Caribbee* Islands, where the Trees are found to succeed as well as in their native Soil; but whether the *Coffee* produced in the *West-Indies*, will prove as good as that brought from *Mocha*, Time will discover. The Berries of this Plant are commonly ripe with us in *April*. *Coffee* is of an excellent drying Quality; it comforts the Brain, eases Pains of the Head, suppresses Vapours, dries up Crudities in the Stomach; prevents Sleepiness after eating, and gives Life and Gaiety to the Spirits, &c.

TEA is the Leaf of a small Shrub, which grows plentifully in several Parts of the *East-Indies*: It is brought over dry'd from *China*, *Japan*, and *Siam*. These Leaves they gather in the Spring, at which time they are little and tender, and of the shape of the Figure in the Plate. It bears a Flower composed of five white Leaves, form'd like a Rose, and some *Stamina*; which, when gone, is succeeded by a thick Cod, like a Hazel-nut, of a Chestnut-colour, in which is found two or three Nuts or Berries, which contain in each a little luscious Almond, of an ill Taste. The Root is fibrous, and spreads upon the Surface of the Earth. This Shrub flourishes equally in rich or poor Ground. The *Tea* which the *English*, *Dutch*, &c. bring over in curl'd or twist'd Leaves, is thus prepar'd by the Natives of the Country; who, after they have gather'd it, dry it gently before the Fire, and the Leaves in drying curl up, just as we have them brought over. In buying *Tea*, choose that which is greenest, the best scented, and which is as little broke into Dust or small Powder as possible. They say, the chief-reason that *Tea* is become such a Commodity throughout *Europe*, is because the *Dutch*, &c. change Sage for it, which the *Japanese* and *Chinese* are great Lovers of: Which is not without Probability, since we have not a Plant endow'd with more Virtues than Sage, especially that sort, which

for





Coca, or Chocolate Tree

for
an
val
bec
not
cu
die
not
TH
any
goo

Nu
its
pas
Lea
bat
flou
as
gro
Blo
and
Tre
long
a y
Mel
not
ples
five
cove
sepa
vide
goo
on t
Wes
Fru
fir
time
ken
be i
ing

for its singular Goodness is call'd *Sage of Virtue* among us; and doubtless, it would be much more valued here, if it grew in *India*, or as far off; but because it is common, we take little account of it, notwithstanding the *Latin* Proverb, *Cur morietur homo, cum crescit salvia in horto?* Why will any Body die that has Sage in his Garden? So that we need not wonder if the *Chinese*, &c. exchange *Tea* for it. Tho' this Liquor is more us'd for Pleasure than for any Medicinal Purpose, yet are there a great many good Qualities attributed to it.

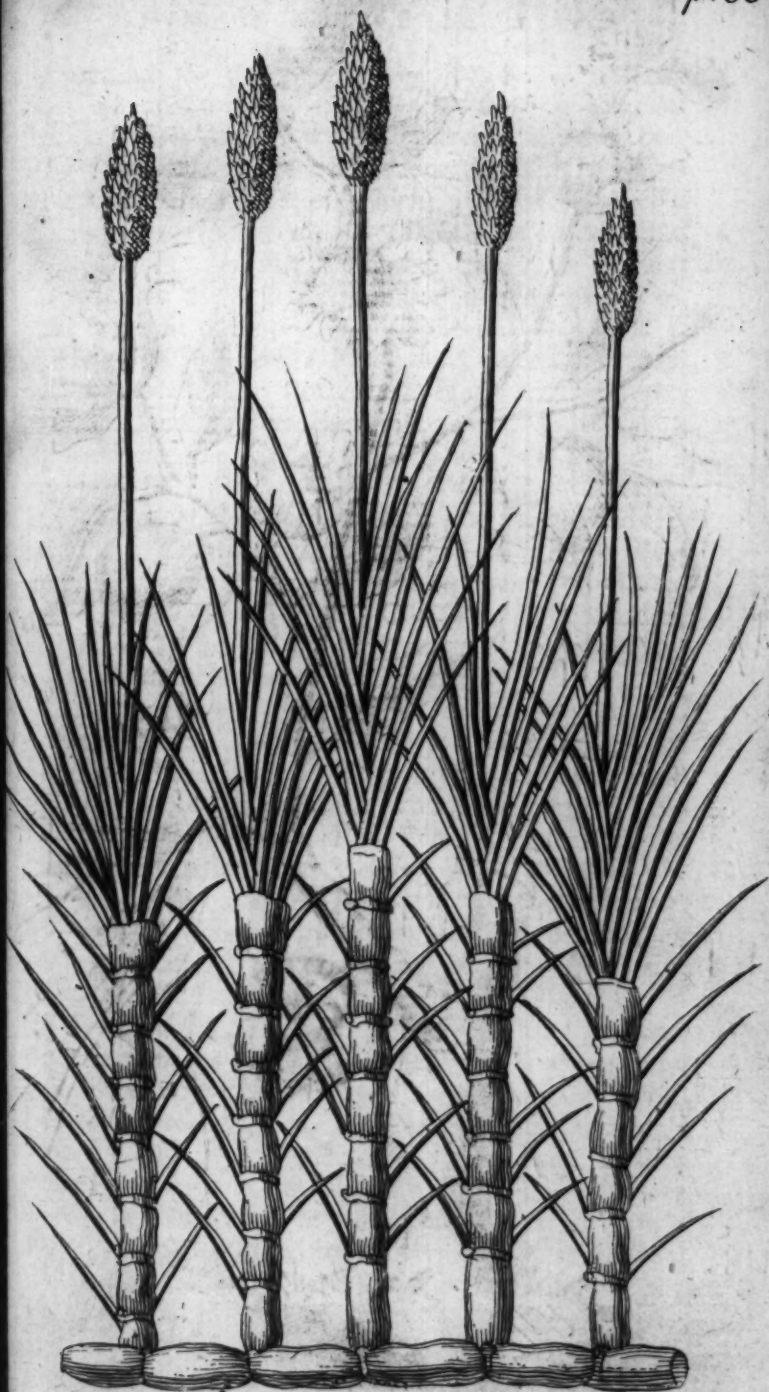
The *Cocao* Tree, that bears the *Chocolate* Nut, much resembles our *Heart-Cherry* Tree; but at its full Growth spreads to a greater breadth in compass, and is something loftier: 'Tis well supplied with Leaves, that resemble those of the *Orange* Tree; but are longer, and more sharp-pointed: It is always flourishing, especially towards the two Solstices; for as the Leaves only fall off successively, and as others grow again; this Tree never appears naked. The Blossoms are regular, and like a *Rose*, but very small and without Smell: Every Blossom is joined to the Tree by a slender Stalk, and leaves in falling off long stringy Filaments, which are green, from which a yellow pointed Fruit is form'd, of the size of our *Melons*; which adhere to the thick Boughs or Branches, not admitting of any Intermedium, or Stem, as *Apples* do. Each Fruit contains from fifteen to twenty-five little Nuts, or *Almonds*; they are each of them cover'd with a yellowish thin Skin; which being separated, a tender Substance appears, which is divided into several unequal Particles, that are oily, of good Nourishment, and leave a certain sharpness upon the Palate. These Trees grow in all the *Spanish West Indies*, *Jamaica*, &c. They commonly bear Fruit within seven Years space, or less, after their first Plantation; tho' in the Interim they are sometimes twice or thrice removed, and great Care is taken to secure them with Shades, that they may not be injured by the over-powerful Heat of the scorching Sun, of which they are not in danger, when

I 2

they

they once become great; for being planted in Ranks and regular Walks, shady Plantane Trees, &c. are rang'd with them; and one shelters the other, both from the parching Sun and boisterous Wind. As it is a Tree of singular Beauty, having large, broad, oblong green Leaves, which fall back, and hang like so many Shields, to preserve and defend the tender Fruit; so is it likewise a Tree of great Profit to the Owner, arising from its most desirable Fruit, which grows after an admirable manner in Cods; studded, as it were in the very Body of the Tree, from the Earth upwards, as well as the Arms and large Boughs: But the Fruit never grows at the Ends of the small Branches. And herein we may easily apprehend, that if Nature had plac'd such bulky Fruit at the ends of the Branches, their great weight must necessarily break them; and the Fruit would fall before it come to Maturity. The Nuts, they say, among the *Indians* and *Spaniards*, go for current Money, even in those Countries where Gold and Silver are naturally produc'd; being to them Food and Raiment, Riches and Delight, all at once. It seems almost unnecessary to tell the Reader, that the Use of these Nuts is to make that well-known Liquor call'd *Chocolate*, every one being acquainted with it.

The *SUGAR-CANE* grows plentifully in many Parts of the *West Indies*, especially the *Caribbee Islands*, as *Barbadoes*, *Jamaica*, *Nevis*, &c. This Plant bears on each Joint a *Cane* of five or six Foot high, adorn'd with long straight green Leaves, much like to some *Flags*, or *Flower-de-luces*, but not so broad, and carries on its top a silver-colour'd Flower, like a plume of Feathers. These *Canes* are not hollow; but the Stalk is stuffed with a porous Substance, moist and sweet in taste. When they come to Maturity, which the Planters know by several Signs, as well as we know when our Harvest is ready; they cut the *Canes* down at or above the first Joint from the Ground; laying them in Heaps, as we usually lay our Corn in Harvest time: then they clear them from their Leaves, and bind the Stalks in Bundles. The Sugar is made,
by



The Sugar Cane



Nutmegs and Mace

by pressing the *Canes* thro' the Rollers of a Mill, from whence there runs a great quantity of pleasant Juice; which being put into Boilers, the watry part is by the force of the Fire evaporated, till it comes to a Consistency: After which they cast it into a Mixture made of certain Ingredients, fit to cleanse and prepare it for graining. All the time it is boiling, they take off the Scum, which rises in great quantities, until it be fit to empty into Coolers, that is, till it arrives to its just Body: From the Coolers, it is again shifted into earthen Pots, with Holes in their Bottoms, and other Pots they call Drips, under them, for receiving the *Molasses*; which in about a Month's time will be separated from the Sugar; this is then knock'd out of the Pots, and put into Casks or Hogs-heads, for Transportation. The *Sugar-Cane* in *England* is very tender, and cannot be preserv'd without a Stove; it is kept as a great Curiosity in the Gardens of such as love a Variety of Plants, as being the Plant from whence the *Sugar* is produced.

NUTMEGS are of two sorts; distinguished by Male and Female; the latter is the best, and most commonly used: The Male, which is a long and large Nut, is seldom used: The Female, which is the rounder and lesser Nut, is that generally sold in the Grocers Shops; and the Trees which bear the Female, or common *Nutmegs*, grow not but in cultivated or improv'd Lands; but the Males, or long *Nutmegs*, grow in Woods and Forests, which makes the *Dutch* call them *Wild Nutmegs*. The Tree that produces the common, or best sort of *Nutmegs*, is as large as a Pear-Tree, with Leaves shap'd like those of the Peach, but much smaller: The Blossom is in the shape of a Rose, of a pleasant Smell; after the Flower is fallen off, a Fruit appears, as large as a green Wall-nut; the *Nutmeg* is the Kernel of this Fruit, which is cover'd with two Barks; the first is very thick, and pull'd off when the Fruit is ripe; the second is much thinner and finer, of a reddish Colour inclining to yellow: It is separated from the *Nutmeg* in order to dry, and is what we call *Mace*. When the *Nutmegs* are separated

rated from their Barks, they dry and preserve them. The Nutmeg-Trees grow plentifully in the great Island of *Banda*, in *Asia*, and in several other Islands in the *East Indies*, belonging to the *Dutch*; it being a Commodity which none but themselves are Masters of. These Isles, they say, are so stock'd with Nutmeg-Trees, that it is almost incredible; and the Climate so good, that the Trees are always loaden with this rich Fruit; and that they have three Crops a Year, *viz.* in *April*, *August*, and *December*. This Tree, according to Mr. *Tavernier*, is not planted, but grows by means of certain Birds, which swallow the *Nutmegs* whole, and throw them up again, without having digested them; and the *Nutmeg* being then cover'd with a viscous and gluey Matter, and being cast upon the Ground, they take Root, and produce a Tree, which grows just as if it had been planted after the manner of others.

CINNAMON is a thin Bark, taken from a Tree about the height of our Willow, which bears a Leaf shaped like the *Indian* Leaf called *Malabathrum*. The Flowers grow in little Cups of a light blue Colour, and odoriferous, succeeded by a Fruit of the shape and size of a small Olive, green at first, but growing black as it ripens. The Tree, which produces *Cinnamon*, grows without Culture in the Island of *Ceylon*, and the Trade thereof is entirely in the Hands of the *Dutch*, who are Masters of the Coasts of that Island. There are nine or ten different sorts of *Cinnamon*; the best sort, which grows in great plenty in *Ceylon*, and is peculiar to that Island, is call'd by the Natives *Rasse coronde*, that is, *sharp, sweet Cinnamon*: It is exported yearly by the *Dutch East India Company*, who have ordered under several Penalties that no other sort be mixed with it. All the several sorts of *Cinnamon* Trees, the best as well as the rest, must grow a certain number of Years, before the Bark is fit to be taken off. Those which grow in Vallies where the Soil is a fine whitish Sand, will be ripe in five Years: others which stand in a wet slimy Soil, must grow seven or eight Years; those are later which

a.
at
ds
g
rs
ut-
li-
th
s a
his
out
the
out
nen
ing
uce
ted

Free
Leaf
The
our,
and
wing
Cin-
Cey-
ands
that
Cin-
ty in
y the
mon:
Com-
that
forts
must
ark is
Vallies
e ripe
slimy
e. later
which





which grow in the shade of other larger Trees; and their Bark hath not that Sweetness and agreeable Taste, observable in the Bark of those which grow in a white sandy Ground, where with little wet they stand fully exposed to the Sun; but it is rather of a bitterish Taste, something astringent, and smells like Camphire. If the Bark be fresh taken off, that Juice which remains in the Tree hath a bitterish Taste, not unlike that of Cloves: On the contrary, if you taste the inner Membrane of the Bark when fresh taken off, you'll find it most exquisitely sweet, and extremely agreeable to the Taste; whereas the outer part of the Bark differs but very little in Taste from that of the common Trees; which shews plainly that all the Sweetness of it is owing only to the inner Membrane. But when the Bark is laid in the Sun in order to its being dried and wound up, this oily and agreeable Sweetness of the inner Membrane diffuses itself throughout the whole outward part of it, (which however hath been first stripped while yet upon the Tree of its outermost greenish Coat) and imbues it so strongly, that for the fragrancy of its Smell and the sweetness of its Taste it is coveted all the World over. The Bark may remain upon some Trees, without losing its Sweetness and Virtue, fourteen, fifteen, or sixteen Years, according to the quality of the Soil they stand in; but after that time it loses by degrees its agreeable Sweetness, and tastes stronger of Camphire: Besides, it is then grown so thick, that if it be laid in the Sun it will no longer shrink and wind itself up, but remain flat. In order to account for the vast quantity of *Cinnamon* that has been, and is still yearly exported from *Ceylon*; several Authors have ascribed, that when the Bark hath been stripped off the *Cinnamon* Trees, it grows again in four or five Years, and becomes fit to be stripped a second time: but this is utterly false; for tho' the Trees, after the Bark hath been once taken off, are cut down to the very Ground, yet the Root quickly pushes forth new Shoots, which grow up and ripen in five, six, seven, or eight Years, some sooner, some later, and then yield their Bark. Thus far the old Roots are instrumental

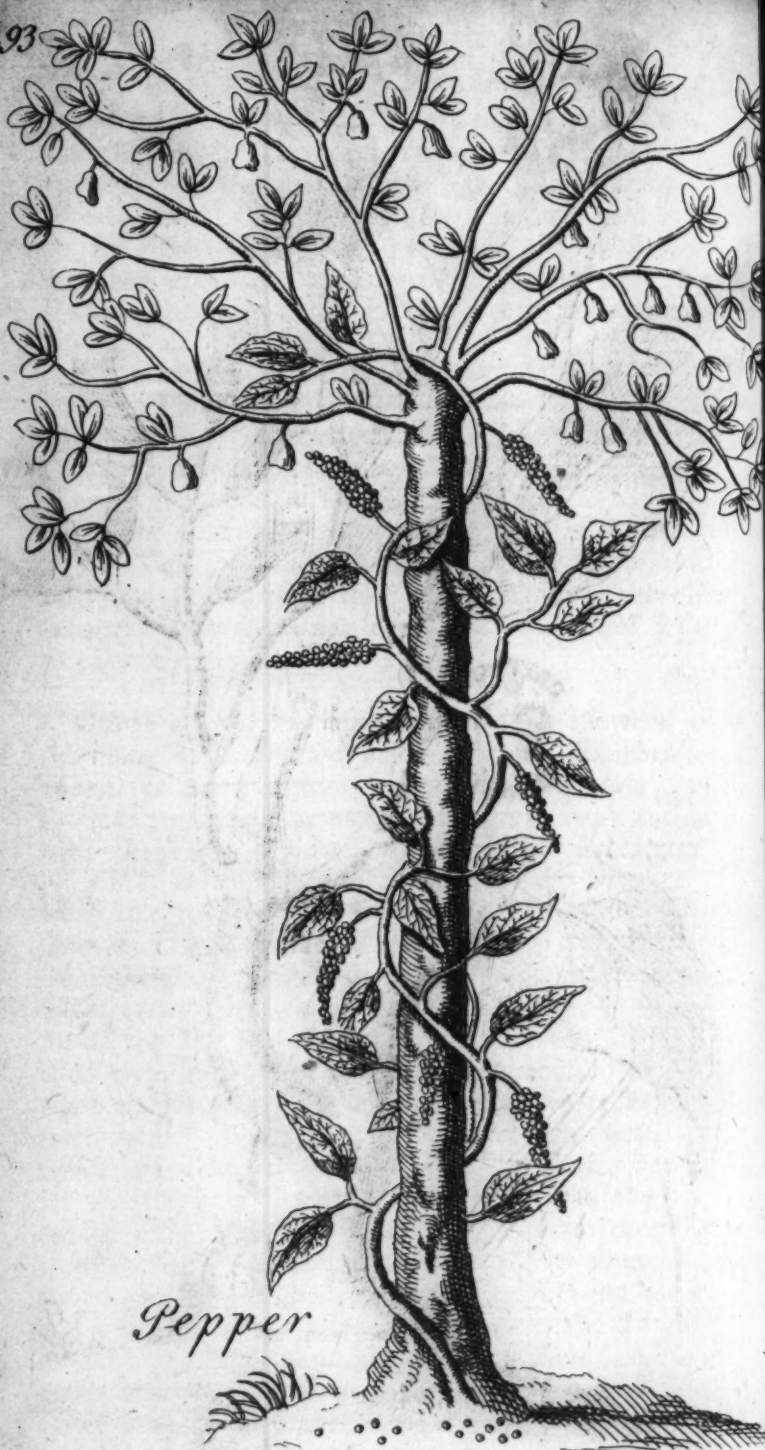
mental to the Growth and Plenty of *Cinnamon* Trees, but their Fruit likewise contributes very much towards the same end: And it is particularly owing to a certain kind of wild Doves, which from their eating the Fruit of this Tree they call *Cinnamon-Eaters*, that they grow so plentifully in this Island; for the Doves, when they fetch Food for their young ones, disperse vast quantities of the Fruit all over the Fields, which occasions the Rise of many thousand young Trees. The Oil drawn from *Cinnamon* by Fire, is reckon'd one of the strongest Cordial Medicines: The Camphire which comes out of the Root, is likewise of very great use in several Distempers; as are also the Oil of Camphire, a very costly thing; the Leaves of the Tree, and the Oil distilled out of them; and lastly the Fruits, with their Oil. In short, there is no part of the *Cinnamon* Tree, but what is of some singular Use in Physick.

CLOVES are the Foot-stalks of the Flowers of the *Clove* Tree, pluck'd before they are full blown: When the Fruit begins to appear, their Colour is of a whitish green; afterwards they grow red; and at last, when ripe, of a dark brown. These Trees grew plentifully in the *Molucca* Islands, till the *Dutch*, not being able to hinder the *English*, and some other Nations from going thither, and bringing away *Cloves* from thence, thought it advisable, to make themselves entirely Masters of that Commodity, to pluck up all the Trees, and transport them to an Island of their own, called *Ternate*; by which means other Nations are forced to purchase that valuable Merchandise from them. There is no other Art used with the *Cloves* after they are pluck'd from the Tree, but to let them dry in the open Fields expos'd to the heat of the Sun, and after that to keep them carefully from the Air. There is also describ'd by some Authors, the *Royal Clove*; so called from bearing on its top a sort of Crown; for which reason the King of the Country keeps it in his own Possession; and because there is a common fabulous Opinion, that the other Trees bow towards this as their King.

The



Clove Tree



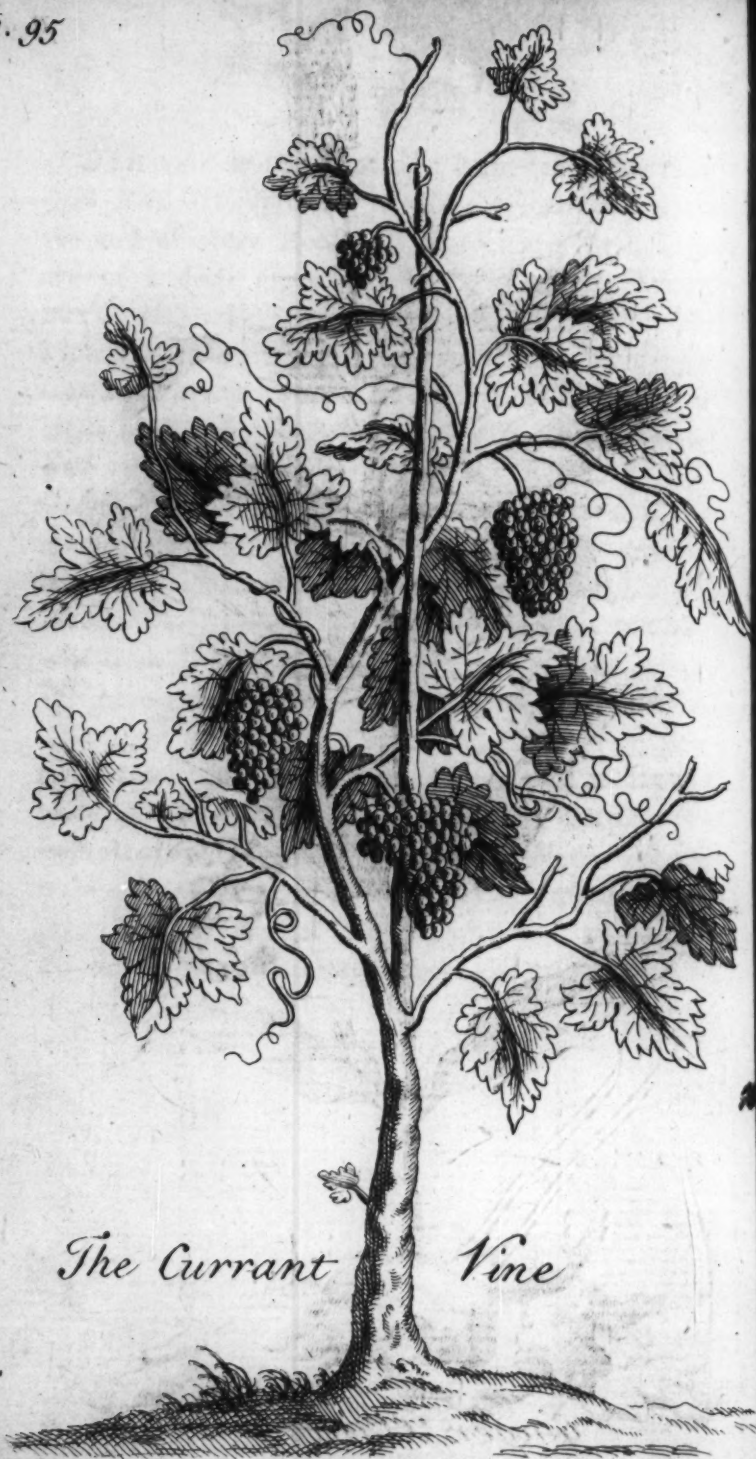
Pepper

The *Black East-Indian PEPPER*, is the Fruit of a climbing Plant we commonly call a *Creeper*; and grows in small Clusters, or Bunches, like those of our Currants. The Seeds are small, round, and green at first; but the ripe fresh Fruit is about the size of a large Currant, and of a red Colour, which in drying turns to black. They say, the common *White Pepper* is only the *Black* stripp'd of its outer Skin. This is done by first steeping it in Sea Water, then drying it, and rubbing it in Sand. There is however another kind of *Pepper*, which is naturally white, but in all other respects is like the Black. The *English* and *Dutch* bring from the *East-Indies* three sorts of *Black Pepper*, which differ not one from the other, but according to the Places where they grow: the finest is that of *Malabar*. The Tree or Bush that bears the *Jamaica Pepper*, grows almost after the same manner as the *Barberry Tree*, but not so lofty; and besides without Prickles; otherwise, both for Stock, Branch and Leaf, it is very much like that Tree. The Grains or Berries are about the size of Juniper-Berries, and of an aromatick Taste, which partaking of that of all the other Spices, it has by the *English* been called *All-spice*. This *Pepper* grows plentifully in many of the Plantations in *Jamaica*.

GINGER is the Root of a Plant called the small *Club Reed*: It represents in shape a sort of Foot at the end of every Root: Its Leaves are large, long, and of a deep green: It bears a reddish Flower, mix'd with a little green; the whole Head of the Flower resembling a Club; from whence by some it is called *Ginger with the Club-Flower*. There are two kinds of *Ginger*, the white or mealy, and the hard black; but the first is reckon'd by much the best. *Ginger* grows both in the *East* and *West-Indies*, and is very much cultivated in the Isles of the *Antilles*; but the greatest quantities come from the *Leeward Islands*, *Barbadoes*, *Nevis*, *St. Christophers*; and likewise from *Jamaica*, and other Places thereabouts. We have now little out of the *East-Indies*, but what is brought thence in a Confection, call'd *green Ginger*; which they prepare in *India*; and is likewise made in *England* and other Parts, by steeping the fresh Root two or three Days in warm Water, keeping it in a *Balneo* all that time; by which means it will grow soft and swell: They then boil it up, either slit or whole, with refin'd Sugar, to a Syrup.



Ginger Plant



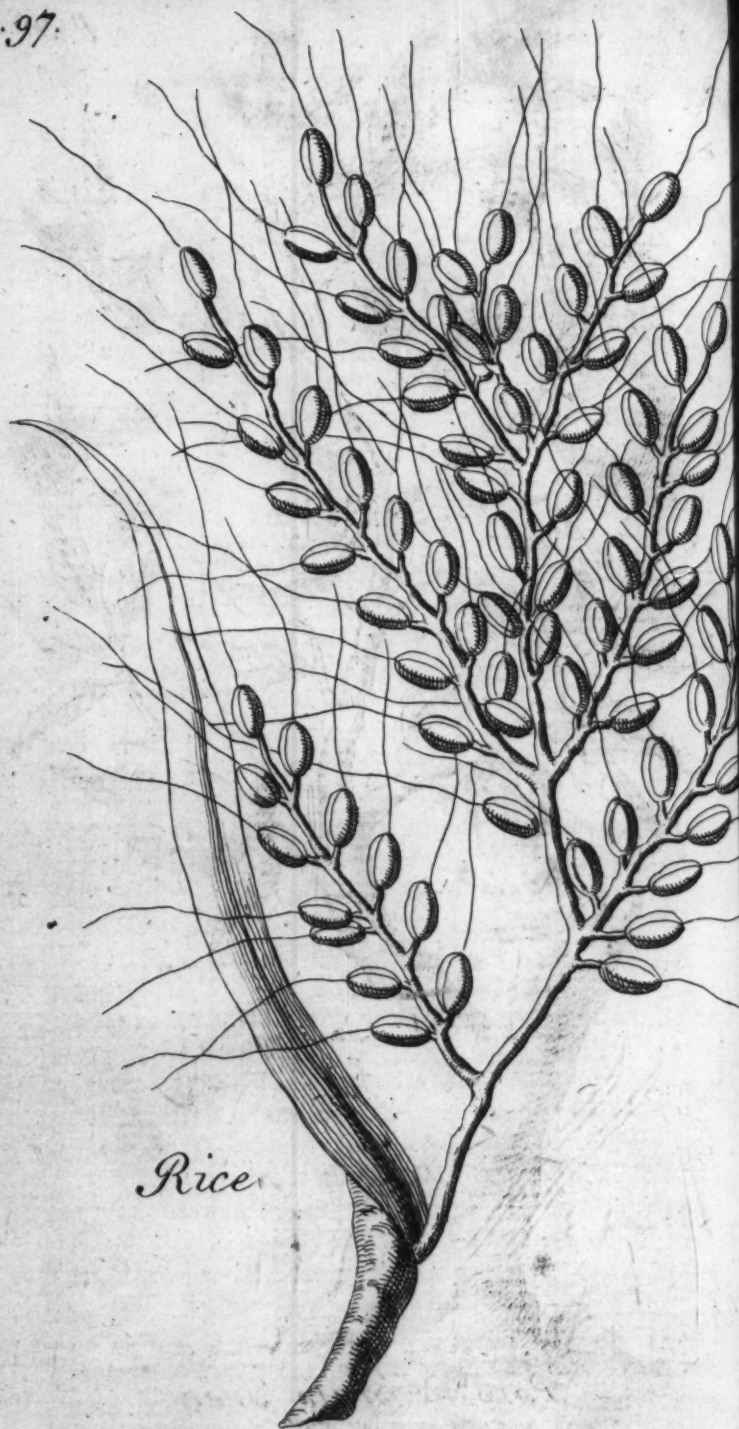
The Currant Vine

CURRENTS that are sold by the Grocers of London, &c. and are well known for their excellent use in Puddings, Cakes, &c. are the Fruit of the Vine, and called the *Corinth Grape*, or vulgarly, the *Current Grape*: Of this kind there are two or three different Colours, as red, black, and tawney. The Vine that bears this Fruit is low, furnish'd with thick Leaves, very much indented, and like all other Vines sending forth Claspers at the Joints; by which it fastens itself to whatever Plant stands near it; and the Fruit is produced in Bunches. These Vines grow plentifully in a vast spacious Plain that is situated behind the Fortress of *Zant* in *Greece*. This Plain is surrounded with Mountains and Hills, and is divided into Vineyards, in which are abundance of Cyprus, Olives, and Houses of Pleasure, which make together with the Fortress and the Mount *Discoppo*, a Prospect perfectly beautiful. When these little Grapes are ripe, which generally happens in *August*, the People of *Zant* gather and stone them, then spread them upon the Ground to dry, and when dry'd carry them into the Town, where they are thrown through a Hole into the great Magazine, call'd the *Seraglio*; and are there press'd so close together in a Mass, that they are oblig'd to use Iron Instruments to pull them out; which done, they put 'em into Casks or Bales of different sizes; and to make them so tight as they are brought to us, they employ Men to tread them with their Feet, for which purpose they rub 'em well with Oil beforehand. *Currents* are brought from several Places in the *Levant*; but the sort we use is chiefly brought from the Islands near the *Morea*. They say, the People of *Zant*, where these *Currents* grow, believe that the *Europeans* use them to dye Cloths, not knowing that they are for eating. As *Currents* are the Fruit of the Vine, so likewise the several kinds of *Raisins* are only so many sorts of Grapes, differing according to the Countries where they are produced. When the Grapes are ripe, they gather the Bunches, and put them to dry in the Sun, turning them from one side to the other, by which means they dry equally; and when dry they put 'em up

up into little Chests, &c. for Transportation: Tho', as some say, before they expose the Bunches to dry in the Sun, they first dip them into a certain Liquor prepared for that purpose.

The POMEGRANATE Tree is a Shrub, whereof there are two kinds; one cultivated in Gardens, and the other wild. The Branches of the first are small, angular, armed with Thorns; the Bark is reddish; the Leaves small, and resemble those of the Myrtle, but less pointed, hanging by reddish Stalks, of a strong Smell, when they are crush'd or bruised. The Flower is large, of a beautiful red, inclining to purple, compos'd of several Leaves, like a Rose in the hollow of a Cup, representing a little Basket of Flowers; the Cup is oblong, hard, purplish, large at the top, having in some measure the figure of a Bell. At the bottom comes a Fruit, after the Flower is gone, which grows into a large round Apple, having a thick, smooth, brittle Rind, adorn'd with a Crown, form'd by the top of the Cup, of a purple Hue, dark without, and yellow within: this Apple is call'd *the Pomegranate*. The inside is divided into several Cells or Partitions full of Seed, heap'd one upon another, being fleshy, of a fine red Colour, abounding with a very pleasant Juice; and each contains in the middle of them, an oblong Grain, of a yellow Colour, and sometimes very irregularly form'd. The *Wild Pomegranate* is a Shrub like the former, but more rough and thorny: They gather the Flowers when in their prime; these are dry'd to keep, which are brought to us from the *Levant*. The *Wild Pomegranate* grows only in the hot Countries. The Juice of the *Pomegranate* is much valued in Physick. There are with us in *England* reckon'd five sorts of *Pomegranate* Trees, chiefly cultivated for Ornament, viz. First, the *common Pomegranate*, second the *sweet*, third the *wild*, fourth the *double flower'd*; and fifth the *American dwarf Pomegranate*. The first of these Trees is now pretty common in the *English* Gardens, where formerly it was nurs'd up in Cases, and preserv'd with great Care, as was also the double Kind; but





Rice

but now they are both hardy enough to resist the severest Cold of our Climate in open Air; and if planted against warm Walls, in a good Situation, the first sort will often produce Fruit, which in warm Seasons will ripen tolerably well: But as these Fruits do not ripen till late in the Autumn, so they are seldom well tasted in *England*: But notwithstanding the Fruit of this Tree seldom arrives to any Perfection in this Country, so as to render it valuable; yet for the Beauty of its scarlet Colour, together with the Variety of its Fruit, it well deserves to have one planted in every good Garden, since the Culture is not great which they require. The chief Care is to plant them upon a rich strong Soil, and in a warm Situation. The double flowering kind of this Plant is much more esteemed than the other in this Country, for the sake of its large beautiful double Flowers, which are of a fine scarlet Colour; and if the Trees are supply'd with Nourishment, will continue to produce Flowers for near three Months successively, which renders it one of the most valuable flowering Trees yet known. A curious account of the whole Culture and Improvement of the *Pomegranate* Plant, as managed in *England*, may be seen in Mr. Miller's *Gardener's Dictionary*, under that Word *Punica*.

RICE is the Product of a Plant much cultivated in most of the Eastern Countries; and great quantities of it are brought into *England*, and other *European* Countries every Year; where it is in great esteem for Puddings, &c. it being too tender to be produc'd in these northern Countries, without the assistance of artificial Heat: But from some Seeds formerly sent to *South-Carolina*, there have been great quantities produc'd; and it is found to succeed equally as well there, as in its native Soil; which is a very great Improvement to our *American* Settlements: it being a Seed of so great Use and Profit, that it is call'd the Manna of the Poor; and throughout several Countries, it is the chief Support of the Inhabitants. This Plant bears its Stalk about three or four Feet high, much thicker and stronger than that of Wheat and

other Corn: The Leaves are long like the Reed, and fleshy; the Flowers blow on the top like Barley; but the Seed, which follows, is dispos'd in Clusters, each of which is enclos'd in a yellow Husk, ending in a spiral Thread, and of an oblong, or rather oval Figure. This Plant grows upon moist Soils, where the Ground can be flow'd over with Water after it is come up; so that whoever would cultivate it in *England* for Curiosity, should sow the Seeds upon a Hot-bed; and when the Plants are come up, they should be transplanted into Pots fill'd with rich light Earth, and plac'd in Pans of Water, which should be plung'd into a Hot-bed; and as the Water wastes, so it must from time to time be renew'd again. In *July* these Plants may be set abroad in a warm Situation, still preserving the Water in the Pans, otherwise they will not thrive; and towards the latter end of *August* they will produce their Grain, which will ripen tolerably well, provided the Autumn proves favourable. Tho' the chief use of *Rice* be for Food, it is sometimes made use of in Medicine: It nourishes well, stops Fluxes, is good in Armies, Camps, and Sieges; because 'tis of light Carriage, and excellent Sustenance, and easily prepared. It increases Blood, and restores in Consumptions. Choose the newest *Rice*, well cleansed, large, that is to say plump, or well fed, white, and not dusty.

There are several Species of the *CORK-Tree* mention'd in some of the *Italian* Catalogues of Plants; but the chief are the broad-leav'd ever-green *Cork-Tree*, and the narrow-leav'd *Cork-Tree*, with smooth Edges: I shall speak only of the first. The broad-leav'd *Cork* that is always green, is a Tree of a moderate height, very much resembling the Oak; but the Trunk is bigger, bearing fewer Boughs, and the Bark a great deal thicker, very light, spongy, and of an ash Colour, tending towards a yellow; which Bark is taken from the Tree first, and afterwards freed from an inner Bark. The Leaves of the *Cork-Tree* are something like those of the Oak, but much larger and longer, likewise softer, and greener on the outside, and





Tobacco Plant

a little indented: The Cups and the Acorns are also like those of the Oak. This Tree grows in the hot Countries, as *Spain, Italy*, towards the *Pyrenees*, and in *Gascony*, &c. When the Inhabitants of those Parts wou'd make a Crop of this Commodity, they take off the Bark of these Trees from the top to the bottom, and lay one piece upon another, to a reasonable height, in a Pit or Ditch that is full of Water; and having loaded it with Weights to keep it down, they leave it in this Condition for some time; and when it is well soak'd, and laid straight, they remove it to another Ditch, and so to a third and fourth; and after that take it out of the Water to dry: which being done, it is transported in Bales to different Parts of the World. Choose your *Cork* in fine Boards, all of a piece, not full of Knots or Chinks, of a moderate thickness, yellowish both without and within; and when it is cut firm and entire, the less porous the better; we commonly call this *Cork*, white *Cork* of *France*, because this sort is made in *Guienne*, chiefly about *Bayonne*, from whence almost all that is used in *France* comes. There is brought from the same Parts another kind of *Cork*, they call *Spanish Cork*, which is likewise according to its usual quality, light, plain, blackish without as if it had been burned; which, as they say, proceeds from nothing else, but its being steep'd in Sea-Water instead of fresh; the inside yellowish and easy to cut, not rotten; but choose the thickest sort you can get, that being much more esteem'd, and dearer than the thin.

Of the *Tobacco* Plant there are five different Species. The first is known by the Planters in *America*, under the Title of *Oroonoko*; of which there seems to be two sorts, varying in the largeness and texture of their Leaves, some having very broad, rough, roundish Leaves; and others are narrower, smoother, and do terminate in a Point: But neither of these sorts are valued by the *American* Planters, because the Produce of this, tho' it is much greater than the narrow-leav'd sort, yet is not near so much esteem'd by the *Englsh*. The second sort is the narrow-leav'd,

commonly call'd the *sweet-scented Tobacco*, from its having a much more agreeable Scent when smoak'd, than the broad-leav'd sort; the Smoak of which is very offensive to most Persons who have not been accustomed to it. This sort is cultivated in great plenty in *Virginia, Cuba, Brasil*, and several other Parts of *America*; from whence it is brought to most Parts of *Europe*, but especially to *England*, it being prohibited to be cultivated in this Country, lest His Majesty's Revenues should be thereby lessen'd; excepting a small quantity that is permitted to be cultivated for Medicinal Use. The third sort is, the greater narrow-leav'd *Perennial Tobacco*, brought from the *French Settlements* in the *West Indies* into the Royal Garden at *Paris*, where it is cultivated in small quantities for making Snuff. The fourth and fifth two smaller sorts of *Tobacco*, are preserv'd in Botanick Gardens for Variety, but are seldom propagated for Use. The *Tobacco* Plants are rais'd from Seed; which they sow first in a rich Ground, and when the Plants are come up, cover them every Morning with Branches of Trees, to defend them from the scorching heat of the Sun; and having clear'd a piece of Ground to receive the Plants, they transplant them in a rainy or moist Season, planting them down again in rows, at about two or three Feet distance from each other, that they may have room to spread, without the Leaves touching one another, so as to make them rot and corrupt. After the *Tobacco* is thus planted, they will require no farther Care, but only from time to time to keep them clear from Weeds, until the Plants begin to shew their Flower-Stems; at which time they cut off the tops of them, that their Leaves may be the better nourish'd, become larger, and of a thicker Substance; and likewise pulling off constantly the Leaves underneath, that hang on the Ground, so that they leave about ten or twelve Leaves upon a Stalk, by which means they increase prodigiously, and become much thicker. When the *Tobacco* is ripe, they cut and spread it upon the Ground; after which they string it upon certain Cords, in little Knots, so that the Plants may not touch one another; then they hang

its
'd,
is
ac-
nty
s of
of
ted
ty's
g a
for
ow-
et-
a at
for
orts
Va-
To-
ow
me
of
the
re-
or
at
ner,
ves
and
will
me
be-
hey
be
ker
the
that
alk,
be-
hey
hey
hat
hey
ang





Cotton

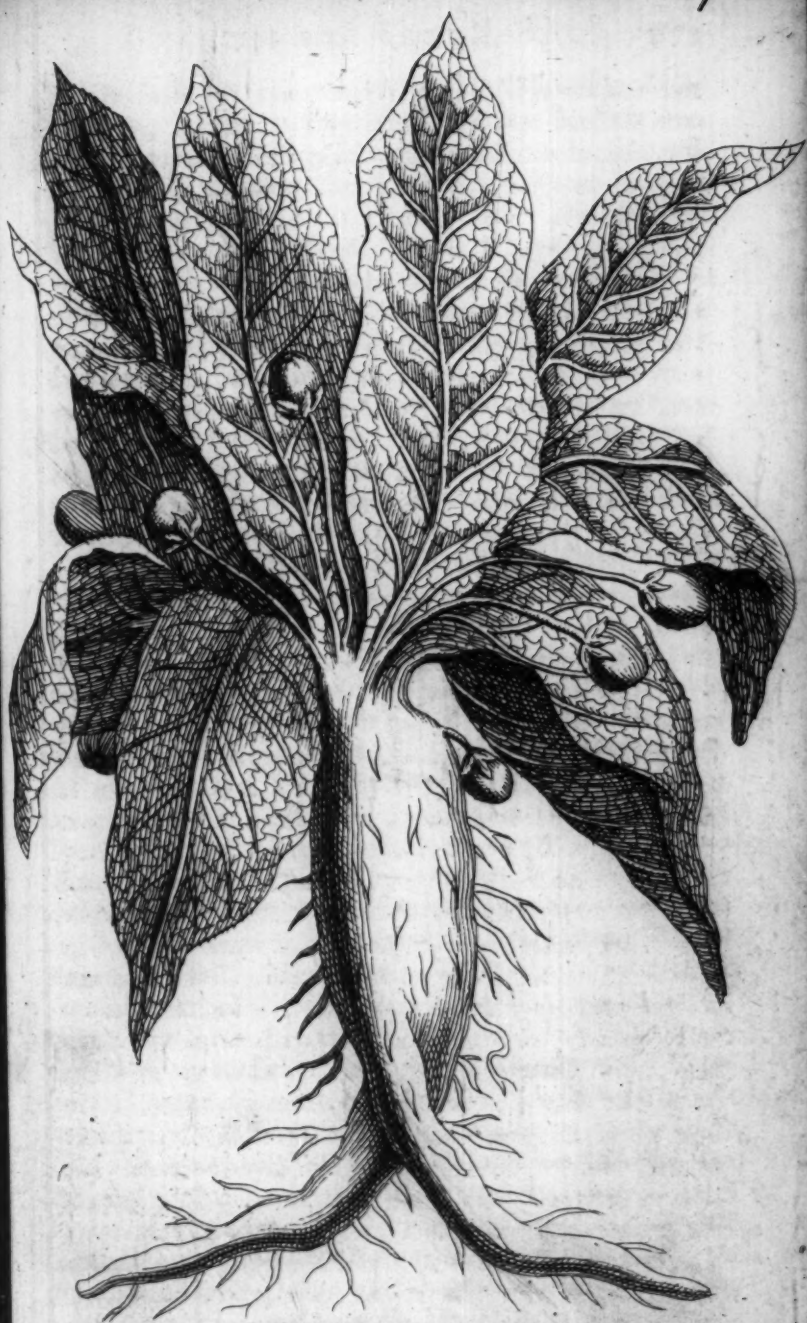
Plant

ing it up to dry in the Air, shelter'd from the wet fifteen or twenty Days: And when it is rightly prepar'd, they make or roll it into what Form is best lik'd by the Buyer.

COTTON is the Product of a Plant which bears a Stalk about two Foot high, cover'd with a reddish hairy Bark, divided into several short Branches: The Leaves are a little less than the Sycamore Leaves, shap'd almost like those of the Vine, hanging to long Stalks, adorn'd with a kind of Nap, or Hair: The Flowers are numerous, fine and large, having the shape or form of a Bell, slit or cut into five or six Divisions to the bottom, of a yellow Colour, mix'd with red or purple: When the Flower is fallen, 'tis succeeded by a Fruit the bigness of a Filbert; which being ripe opens into three or four Partitions, from whence appears a Flake of *Cotton*, white as Snow, which swells up or timesies by Heat, to the size of a little Apple. It contains in it many gross Seeds, like small Peas, oblong and cottony; each having in it a little oily Kernel, sweet to the Taste. There is another sort of *Cotton Tree* that differs from the former in bigness, for this grows to the height of four or five Feet: The Leaves indented deep into three Parts, without Nap or Down: The Flowers and Fruit are like those of the other Kind. Both these sorts of *Cotton* grow in *Egypt*, *Syria*, *Cyprus*, *Candia*, and the *Indies*. In *Jamaica*, *Barbadoes*, and other Places in the *West Indies*, the *Cotton Tree* usually grows to a reasonable height, spreading forth its Branches on all sides; with small, green, pointed Leaves; and beareth a Flower in form almost like the Sweet-Briar Rose, but of a yellowish Colour: After the Blossoms are fallen, there followeth a kind of greenish round Button, or Knob almost as big as a Tennis Ball, having a thin crusty Shell; which when full ripe is of a dark brown or blackish Colour: In these round Buttons is inclosed the *Cotton*, which open when ripe in several Partitions like the former, out of which the *Cotton* falleth, if not timely gather'd: It contains likewise a great number of small blackish Seeds, that grow inclosed in

the same Shell, which before the *Cotton* is made use of are pick'd out. There grow likewise in some of the *American Plantations*, *Cotton Bushes*, or *Shrubs*, which approach very near in likeness to those of *Egypt*, *Arabia*, &c.

The **MANDRAKE** Plant is distinguish'd by two Species: viz. the Common with a round Fruit, called the *Male Mandrake*, and that with the purplish blue Flower, called the *Female Mandrake*. The Leaves of the former rise directly from the Root, above a Foot long, broader than a Man's Hand in the middle, and narrow at both Ends, smooth, of a deep green Colour, and a disagreeable Smell. The Flowers of both these Plants are of the shape of a Bell, divided at the tops into several Parts, which afterwards becomes a globular soft Fruit, in which is contain'd many kidney-shap'd Seeds. The Root, as some say, represents, when it is whole, the lower Parts of a Man, from whence it is called *Anthropomorpha*, which signifies the Figure of a Man. But as to this feigned resemblance of an human Form, which the Root of this Plant is said to carry, 'tis all Imposture, owing to the Cunning of Quacks and designing Knaves, who deceive the Ignorant with fictitious Images shap'd from the fresh Roots of *Briony* and other Plants: And what is reported as to the manner of rooting up this Plant, by tying a Dog thereto, to prevent the certain Death of the Person who should dare to attempt it, and the Groans it emits upon the Force offer'd, &c. it is all a salsome Fable: for several large Roots of this Plant have been taken up; some of which have been transplanted into other Places, without observing any particular difference in this from any other deep-rooting Plant. Some Persons worthy of Credit, have deliver'd as a Truth, that one of these Roots will remain sound above fifty Years, and be as vigorous as a young Plant: but they should never be remov'd after their Roots have arriv'd to any considerable size, which would break their lower Fibres, and so stint the Plants, as that they will not recover their former strength in two or three Years. The *Female*
Man-



Mandrake Plant



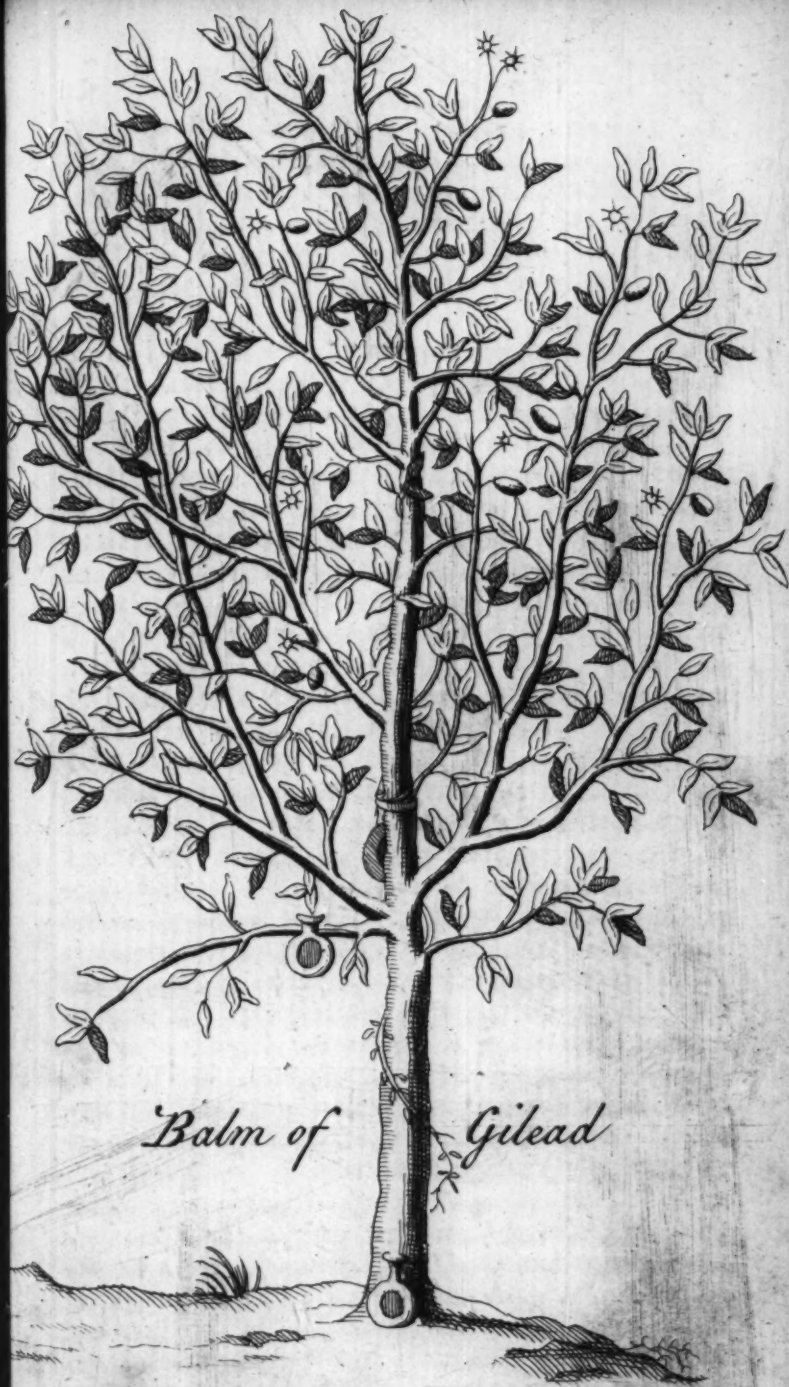
Mandrake with the bluish purple Flower; differs from the former, in that its Leaves are smaller, narrower, more folded, blacker, trailing on the Ground, of a strong stinking Smell; and the Fruit less and paler, not form'd like a Pear, as some Authors will have it; but round, scented, full of Juice, and containing very small black Seeds. The Root is about a Foot long, divided into two Branches, brown without, white within, and furnish'd with some Fibres, but nothing like the Male Plant. Both sorts grow in hot Countries, in the Plains or mountainous Places; but the last much rarer. These Plants are propagated in Gardens from Seeds, which shou'd be sown upon a Bed of light Earth soon after they are ripe; where they should remain till the latter end of *August*, (observing always to keep them clear from Weeds) at which time they should be taken up very carefully, and transplanted into the Places where they are to remain, which should be a light deep Soil, for their Roots do always run downwards very deep; and if the Plants are not disturb'd, they will grow to a large size in a few Years, and will produce great quantities of Flowers and Fruit, and they will abide a great many Years. There are *Mandrakes* mention'd in the 30th Chap. of *Genesis*, which *Reuben* is said to have found in the Field, in the time of Wheat Harvest; and with which his Mother *Leah* purchas'd from her Sister *Rachel* no less a Favour than the Enjoyment of her Husband. What those *Mandrakes* should be that were so desirable to *Rachel*; whether she coveted them for their delectable Taste, their fragrant Smell, or their beautiful Colour, does not appear: And as our learned Commentators differ in their Opinions about it, I shall not venture to give my own; but only observe, that in the *Canticles* it is said, *The Mandrakes give a smell, and at our gates are all manner of pleasant fruits*: Which seems to intimate, as if the *Mandrakes* were a Fruit of a pleasant Taste, a fragrant Smell, and delightful to the Eye; for when *Solomon* says, *the Mandrakes give a smell*; sure he must mean a grateful Smell, or methinks he would hardly have introduc'd them to adorn a Pastoral Song; and as he

imme-

immediately adds, *at our gates are all manner of pleasant fruits*; it seems to imply, that the *Mandrake* was likewise a pleasant Fruit, which perhaps, was so both to the Eye and Palate: But be that as it will, this we may venture to affirm, that the *Mandrake* Plants known to us now, whether wild or cultivated, have no such desirable qualities, as to render them so valuable to the good Women of our days, to give in exchange their Husbands for them: For these, contrary to what is mention'd in Scripture, have a disagreeable Smell.

BALM of Gilead is a liquid white Balsam, that flows of itself (tho' sometimes they make Incisions, when the Liquor flows not freely) during Summer, from the Trunk of a Plant, called *Balsamum Syriacum folio Rutæ*; that bears Leaves like Rue; and white Flowers shap'd like Stars; in the middle of which rise little Berries, that are sharp at the end, in which is a small Kernel: It sticks to the Branches by means of a very small Stalk; is green at first, and grows brown as it ripens. When the *Balsam* first runs, it is of the consistence of Oil of sweet Almonds, but by Age becomes like Turpentine, loses much of its Smell, and grows sometimes blackish. When fresh, it is of a very agreeable aromack Smell, and of a Taste like Citron Peel. *Jerico* was once the only Place in the World where this true *Balsam* was to be found; but since the *Turks* were Masters of the Holy Land, they have transplanted these Shrubs into their Gardens at *Grand Cairo*, &c. where they are guarded by *Janisaries*, or Soldiers, during the time the *Balsam* flows; at which time it is very difficult for a Christian to get a Sight of these Plants, which are defended with very high Walls, as well as Soldiers, against their entering. And as to the *Balsam*, it is almost impossible to get any upon the Place, unless it be by means of some Ambassador, to whom the Grand Seignior has made a Present of it, or by the Soldiers who watch this precious Liquor; by which we may understand, that what several Persons pretend to sell for true *Balsam*, is nothing but white

Balsam



Balm of Gilead

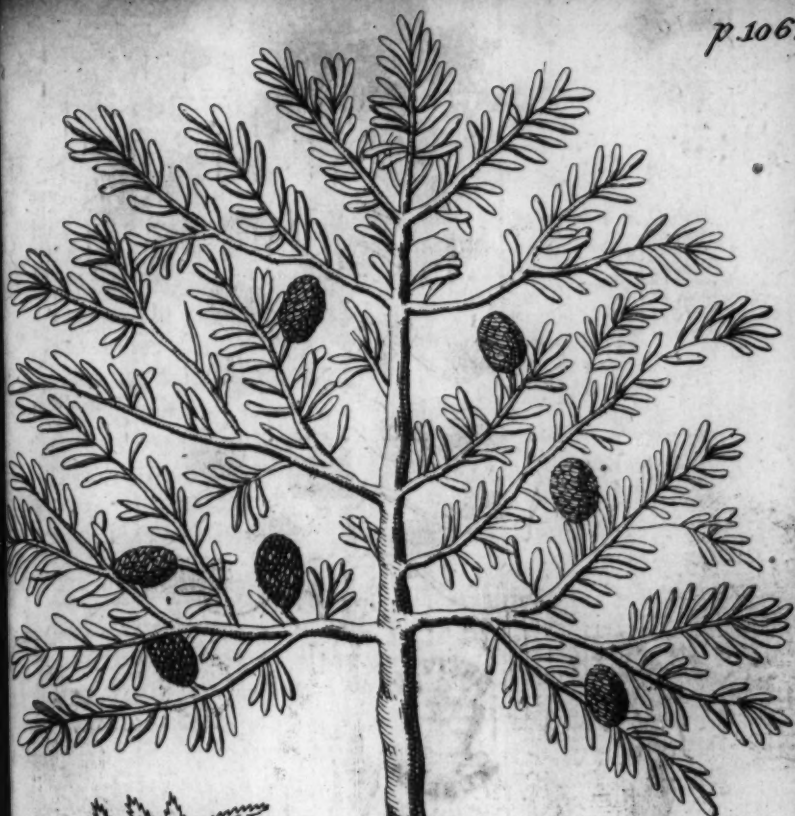


Balsam of Peru; which they prepare with Spirit of Wine rectified, or with some Oils distilled. Mr. Pomet says, a Friend of his made him a Present of one Ounce, which he brought from *Grand Cairo*; it was of a solid Consistence, like that of *Turpentine of Chio*, of a golden yellow Colour, and a Citron Smell.

The *CEDAR of Libanus* is a very large, thick, straight Tree: Its Leaves small and slender; being much narrower than those of the Pine-Tree, disposed in Clusters along the Branches; and the Fruit like our Pine-Apples; but grows upon the upper part of the Branches, and stands erect, having a strong woody central Style, by which it is firmly annex'd to the Branch, so as with difficulty to be taken off: which central Style remains upon the Branches, after the Cone is fallen to pieces; so that they never drop off whole as the Pine-Apples do. It is said, that from the Trunk, and the large Branches of this Tree, there flows, during the great Heats, without any Incision, a sort of white Resin, very clear, and of a grateful Odour; which they call *Cedar-Gum*, of which the largest Trees yield not less than six Ounces a day. The Cones of the Cedar are brought from the *Levant*, which, if preserv'd intire, will continue their Seeds for several Years: The time of their ripening is commonly in the Spring, and are near one Year old before we receive them; for which they are not the worse, but rather the better. To get the Seeds out of the Cone, they split it, by driving a sharp piece of Iron through the Centre lengthways, and so pull the Seeds out with their Fingers; which Seeds are fasten'd to a thin leasy Substance, as are those of the *Firr-Tree*. For the ordering the Cedar Plant, see *Miller's Directions* in his *Gardener's Dictionary*. What we find mention'd in Scripture of the *lofty Cedars*, can be no ways applicable to the Stature of this Tree; since, from the Experience we have of those now growing in *England*, as also from the Testimony of several who have visited those few remaining Trees on *Mount Libanus*, they are not inclin'd to grow very lofty, but, on the contrary, extend their Branches
very

very far: To which the Allusion made by the *Psalmist* agrees very well, when he is describing the flourishing State of a People, and says, *They shall spread their Branches like the Cedar Tree*. Mr. Maundrel, in his *Travels*, says, when he visited *Mount Libanus*, there were but sixteen large Trees remaining; some of which were of a prodigious Bulk, but that there were many more young Trees of a smaller size; he measur'd one of the largest, and found it to be twelve Yards six Inches in girth, and yet sound, and thirty seven Yards in the spread of its Boughs. At about five or six Yards from the Ground, it was divided into five Limbs, each of which was equal to a great Tree. The Wood of this famous Tree is accounted Proof against all Putrefaction of Animal Bodies: The Saw-dust of it is thought to be one of the Secrets used by those Mountebanks who pretend to have the embalming Mystery. This Wood is also said to yield an Oil which is famous for preserving Books and Writings: and the Wood is thought by my Lord Bacon to continue a thousand Years sound. Of Cedar Wood was most of the Timber-Work of that glorious Structure, the *Temple of Jerusalem*.

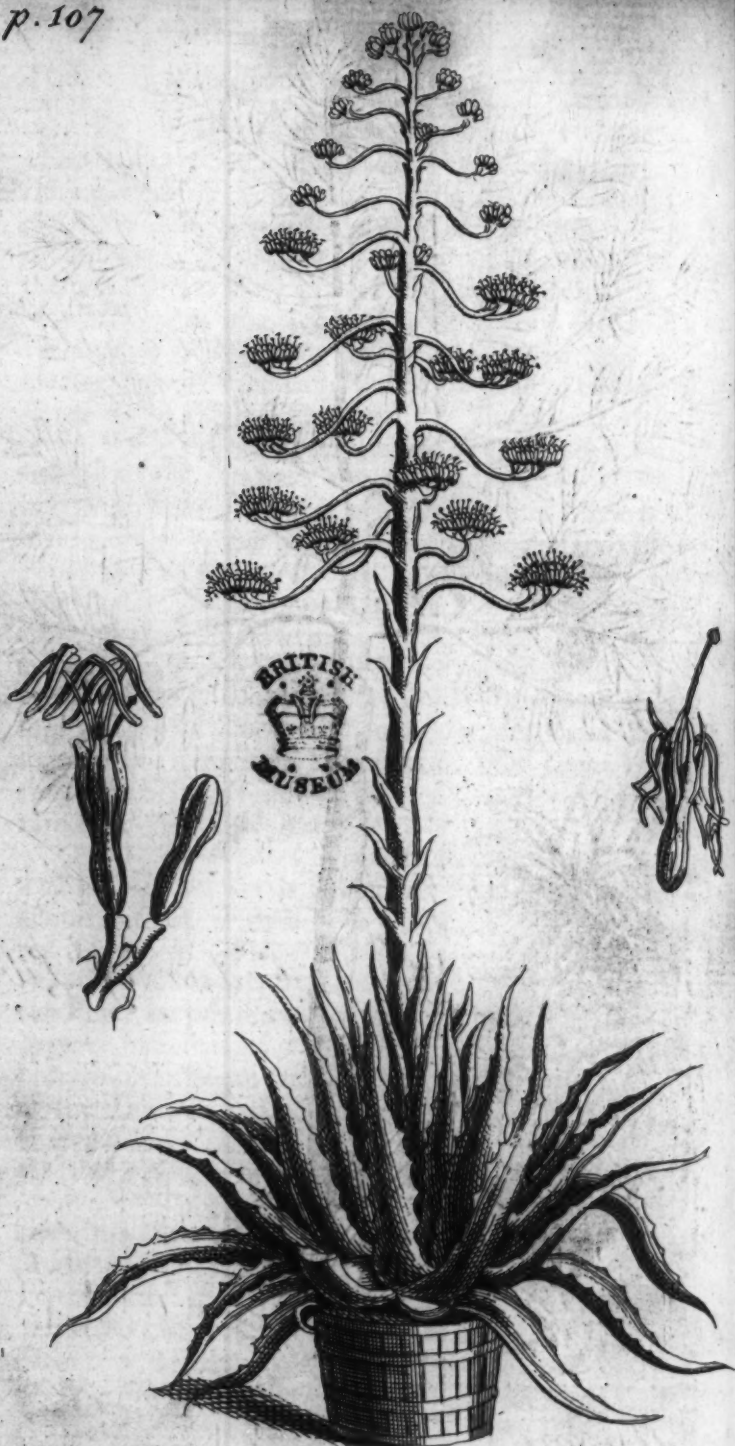
The *ANANAS* is a kind of Pine-Apple; adorned on the top with a little Crown, and a Bunch of red Leaves like Fire: It has a scaly Rind or Shell, like the Pine-Apple; and the Fruit like the Cones of the Pine, in the Form of a Sugar-Loaf: The inside appears like that of the Melon; the Flesh is fibrous, but dissolves in the Mouth, having the delicious Taste of the Peach, the Quince, and the Muscadine Grape all together. It is call'd the *King of Fruits*, because, for the richness of its Flavour, it surpasses all the known Fruits in the World; and also for the Crown upon the Head of it, which is a peculiar Mark of its Royalty; and at its fall produces a young King, that succeeds in all his admirable Qualities: This Fruit is produced from an herbaceous Plant, which hath Leaves somewhat resembling those of an Aloe, and are for the most part saw'd on their Edges, but are much thinner, and not so juicy as the Aloe. From the



Cedar of Libanus



The Ananus



Great American Aloe

the Fruit's resembling the Cones of the Pine Tree, it is supposed to have its Name. Where this Plant is a Native, is not easy to determine; but it was brought from the Factories in the *East Indies*, and planted in the hottest Islands in the *West Indies*, where they are in great plenty and extraordinary goodness: But it hath been very lately, that it was introduc'd into the *European* Gardens, so as to produce Fruit. The first Person who succeeded in this Affair, was Monsieur *Le Cour* at *Leyden* in *Holland*, who, after a great many Trials with little or no success, did at last hit upon a proper degree of Heat and Management, so as to produce Fruit equally as good (tho' not so large) as those which are produc'd in the *West Indies*, as hath been often affirm'd by Persons who have lived many Years there; and 'tis to this worthy Cultivator of Gardening, who did not spare any Pains or Expence to accomplish it, that all the Lovers thereof are oblig'd for introducing this King of Fruits amongst them; and it was from him that our Gardens in *England* were first supplied, tho' we have since had large quantities brought from *America*. From the Juice of this Fruit is made a Wine, almost equal to Malmsey Sack, and will intoxicate as soon as the strongest Wine.

The *ALOE* is a Plant whose Leaves are thick and succulent, and for the most part beset with Spines on the Edges: The Flower consists of one Leaf, is tubulous, and cut into six Segments at the top, like the Hyacinth: The Fruit is oblong and cylindrical; which is divided into three Cells, in which are confin'd flat, and for the most part semicircular Seeds. There are a great variety of these Plants in the curious Gardens of Botany in *England*, near forty different sorts, which are Natives both of the *East* and *West Indies*; but the most curious sorts are brought from the *Cape of Good Hope*. Most of the *African* sorts of *Aloes* do produce Flowers with us Annually, when grown to a sufficient size, which is often the second, and seldom more than the third

or fourth Year, after planting from Off-sets; but the *American Aloes* (which do, for the most part, produce their Flower-stems immediately from the Center of the Plant) seldom flower till they are of a considerable Age, and this but once during the Life of the Plant; for when the Flower-stem begins to shoot from the middle of the Plant (which, for the most part, is of a large size, and grows to a great height) it draws all the Nourishment from the Leaves; so that, as that advances, the Leaves decay: and when the Flowers are fully blown, scarce any of the Leaves remain alive; but whenever this happens, the old Root sends forth a numerous quantity of Off-sets for increase: And it is not till this time, that some of these sorts can be increased. There is a vulgar Error or two relating to the large *American Aloe*, which is, that it never flowers until it is an Hundred Years old: this is a Mistake; since we have had several of them flower in *England*, some of which were known not to exceed fifty Years old; and others, that flower'd many Years ago, cannot be suppos'd to have been in *England* so long as to arrive at that Age, since they were thought too tender for our Climate at that time, when Green-houses were not known. Another common Error is, that when the Flower opens, it makes a Report like that of firing a Gun: This is sufficiently confuted by all those, who have been where these Plants have flower'd: But probably the rise of this Story might proceed from some Persons saying, when one of these Plants flower'd, it made a great Noise; meaning thereby, that whenever one of them flower'd in *England*, it was spread abroad as an uncommon thing, and occasion'd a great Noise among the neighbouring Inhabitants; most of whom usually repair to see it, as a thing that rarely happens, and as a great Curiosity. In the Year 1729. in the Month of September, one of these great *American Aloes* flower'd in Mr. Cowell's Garden at *Hoxton*, and though it was above forty Years old, did not shoot forth its Stem till about eleven Weeks before, in which short time it shot up





Sensible Plant

to the height of twenty-two Feet: The deserv'd Fame of this wonderful Plant being spread abroad, occasion'd a vast resort of People, of all Ranks, to see so great a Curiosity.

The Contexture of the SENSIBLE PLANT is very surprising; for, upon touching any of the Sprigs with Leaves on, all the Leaves on that Sprig contracting themselves by Pairs, joined their upper Superfices close together. Upon the dropping a Drop of *Aqua-fortis* on the Sprig betwixt the Leaves, all the Leaves above shut presently, those below by Pairs successively after, by and by the lower Leaves of the other Branches, and so every Pair successively, with some little distance of time betwixt, to the top of each Sprig, and so they continued shut for some time: But returning to the Garden the next Day, and several Days after, found all the Leaves dilated again on two of the Sprigs; but where the *Aqua-fortis* had dropped, upwards, dead and withered; but those below on the same Sprig, green, and closing upon the Touch as before, and continu'd so. With a Pair of Scissars, as suddenly as it could be done, one of the Leaves was clipped off in the middle; upon which that Pair, and the Pair above, closed presently; after a little Interval those under, and so the rest of the Pairs to the bottom of the Sprig; and then the Motion began in the lower Pairs on the other Sprigs, and so shut them by Pairs upwards, though not with such distinct distances. Upon cutting off one of the harder Branches, there came out a Liquor, without pressure; very clear, and of a bright greenish Colour, tasting at first a little bitterish, but after leaving a liquorice like Taste behind:

L

which

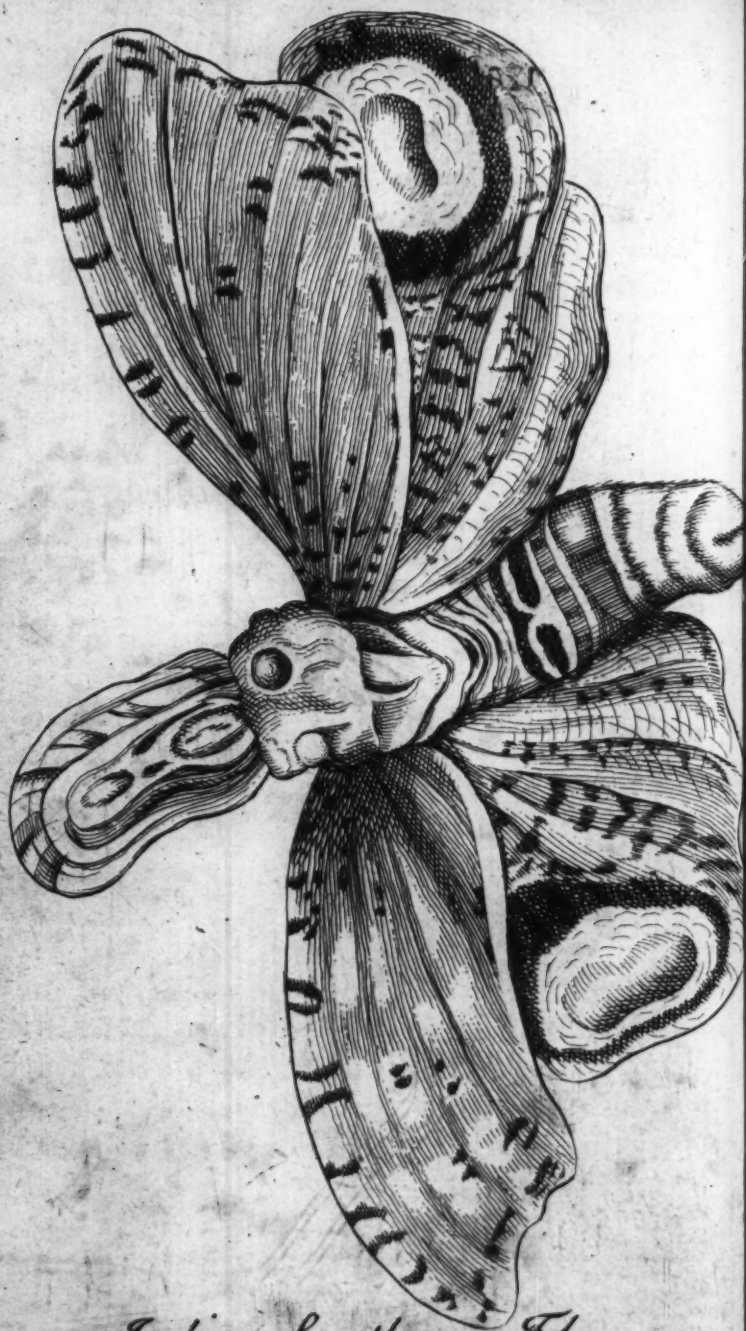
110 *A DESCRIPTION, &c.*

which probably, the Motion of this Plant upon touching might proceed from this; that there being a constant Intercourse betwixt every Part of this Plant and its Root, either by a Circulation of this Liquor, or a constant pressing of the subtiler Parts of it to every Extremity of the Plant. The above Experiments were made by Dr. Hooke, on some of these Plants which grew in a Garden in St. James's Park. I have read, that in the Passage of the *Isthmus*, from *Nombre de Dios* to *Panama*, there is a whole Wood full of *Sensitive Trees*, of which, as soon as they are touch'd, the Leaves close and move with a rattling Noise, and twist themselves together into a winding Figure.



Natural





Indian Lanthorn Fly

Natural *and* Philosophical
C O N J E C T U R E S
O N T H E
I G N I S F A T U U S,
O R
JACK IN THE LANTHORN:

Endeavouring to prove, that
The *LIGHT* so called proceeds from
Some *FLYING INSECT*;

And not from a
FIRED VAPOUR, as generally believ'd.

W I T H
A Description and Curious Figure of the
Indian LANTHORN FLY, a Nocturnal
Insect, which carries a Light in dark
Nights, equal to that of our *Will with a*
Whisp.

L O N D O N:
Printed for T. BOREMAN, near *Child's* Coffee-
House in *St. Paul's Church-Yard*.

M.DCC.XXXVI.

Natural and Philosophical
 CONJECTURES
 ON THE
 LIGHTS OF
 OR
 JACK IN THE LANTERN

THE LIGHTS OF
 Come FLY IN INSECT



And not from a
 Fired Vapour, as generally believed
 WITH

A Description and Curious Figure of the
 Flying Lanthorn Fly, a Nocturnal
 Insect which emits a Light in dark
 nights, equal to that of our Wax tapers

L O N D O N
 Printed by W. BARNARD, near St. Pauls Church
 in the Strand 1784



IGNIS FATUUS,

O R

JACK IN THE LANTHORN, a Flying INSECT.



THE Notion that an *Ignis Fatuus*, or *Jack in the Lanthorn*, is a fired Vapour exhaled from boggy Places, being founded on the Judgment of many Learned and Ingenious Persons, has so far prevailed, that the Generality of Mankind seem to acquiesce in that Solution of this surprizing Phænomon.

An Attempt therefore to prove the contrary, and that the *Light* called by this Name proceeds from some nocturnal *Flying-Insect*, will perhaps be deemed vain and rash. However, I shall take the Liberty to assign the Reasons which induce me to believe it, and my Objections to its being a Vapour; which I submit to the Judgment of the Curious, till time and experience shall demonstrate the real Truth.

If in my Pursuit of the Wanderer I should chance to be misled, it will be in common with all that have followed the Chace, with this advantage, that

114 JACK IN THE LANTHORN,

I can sustain no Injuries from it. And the Attempt may invite others, who may be more successful in their Endeavours. The Conjecture must be agreeable, and the Probability will be of some use, if it helps to dispossess fearful Country People of their superstitious Apprehensions.

The first Hint of my Opinion I received from *Meriana's* Account of the famous *Indian LANTHORN FLY*, publish'd amongst her *Insects of Surinam*; which Account, being not in the least foreign to the Subject, nor perhaps unpleasant to the Reader, I shall here insert.

The *Lanthorn Fly* is a Nocturnal Insect, that has an Hood, or Bladder on its Head, which gives a Light like a Lanthorn in the Night, but by Day-light is clear and transparent, very curiously adorned with Stripes of a red and green Colour. Such a shining came forth from this Bladder in the Night, that it was possible by the Light of it to have read Writing of tolerable large Characters. She says, that when once upon a time, the *Indians* she sent to seek for Insects, brought her of these *Lanthorn Flies* in great abundance, she shut them up in a large Chest, not knowing as yet that they shone by Night; but being awak'd and frighten'd in the Night out of her Sleep by an unusual Noise; jumping out of Bed, order'd a Light to be brought; not knowing what that uncommon Disturbance which she heard in her House should be: It immediately appear'd that the Noise came from the Chest; upon which, with some disorder of Mind they open'd it; but still more frighten'd, they suddenly clapp'd the Lid down again; because in the opening, there came as it were a Flame of Fire, as often as a new Insect flew out: which

at

at length being observ'd, and coming to themselves again, they gather'd the little Creatures together once more; admiring that so considerable a Light should proceed from them.

The Wings and whole Body of this Insect are elegantly adorned with a Mixture of beautiful Colours; as red, green, yellow, &c. It's said, the Creature can contract or dilate the Hood or Bladder over its Head at pleasure: and that they hide all their Light when taken, but when at liberty afford it plentifully. Accordingly, those which *Meriana* inclos'd having the Liberty of a large dark Chest, display'd their Light, and it being their proper time to fly, endeavour'd to escape as soon as the Lid was open.

The more I consider'd this wonderful Account, the stronger it inclin'd me to believe the *Jack in the Lanthorn* of our own Country, was likewise no other than the shining of some night-flying Insect. And indeed I was too well pleas'd with the Discovery I thought I had made, vainly imagining my Opinion to be singular; nor knowing that any Person had formed the Conjecture before my self; till, looking into the *Philosophical Transactions*, I was agreeably surprized, to find that two learned and eminent Persons, the late Mr. *Fr. Willughby*, and Mr. *Ray*, were both of the same Opinion. The late learned and ingenious Dr. *Derham* indeed, who publish'd that Account, was of a contrary Opinion: believing those Appearances to be fired Vapours. But with due Submission to the Judgment of so great a Man, the Account he has given of this Phenomenon, seems in every Circumstance to agree much better with that of a living Creature, than an inflammable Vapour:

Which

Which Account of the *Ignes Fatui*, I shall transcribe from the *Philosophical Transactions*, for the sake of such of my Readers as are not possess'd of those Books.

But I shall first give the Reasons which incline me to believe these Appearances only the shining of some Nocturnal Flies; because they are the Result of such Thoughts as occur'd from considering the Subject itself, before I knew the Sentiments of those eminent Persons abovemention'd:

I apprehend then that the *Ignis Fatuus* must be rather a flying Insect than a Vapour, because the Properties attributed to it, such as its Motion, directing itself which way it pleases, shunning whatever Obstruction happens in its Passage, and the like, in which almost all Accounts agree, correspond much better to that of an Insect flying, or the Actions of something guided by Sense; than to that of a fired Vapour, which must be absolutely carried with the Wind, let it blow which way it will: And may we not very naturally suppose, that if it was only a Vapour driven by the Wind, it would some time or other have been blown exactly to the Spot where some Persons were passing, that might have discover'd what it was; or directly to some House, Village, Town? &c. I cannot imagine how a mere Vapour could shun any of these Obstructions. And would a fired Vapour, if once extinct, (as these Appearances are frequently observed to be suddenly dark, and immediately to shine again) be enkindled in a Body any more?

Methinks, if *Ignes Fatui* were only Vapours, they would sometimes be raised higher in the Air than these Lights are observed to be, which seldom ex-

ceeds

ceeds six Feet above the Ground; unless it be to mount over a Hedge, or some such thing. But their passing along a few Feet above the Ground, or surface of the Water, very much agrees with that of some Insects in quest of their Prey; and does not their settling of a sudden, and rising again immediately, answer likewise? It looks very much as if they had found something which they were in search after. From hence there appears great Reason to believe it nothing else but a Night-flying Insect; and that the Light it carries is given either to seek its Food with, or woo its Female, or perhaps both.

All Accounts agree, that the *Ignis Fatuus* is never seen but in a dark Night, which is still a stronger Argument of its being a living Creature; for a Vapour might be exhald when it was not so dark, as well as when it was, and be visible too. But supposing it a Creature that flies by Night, it may either not fall out in light Nights, or its Organs of Sight be so adapted, as to see at such a time without the assistance of this extraordinary Light, and not expend its shining Matter when its natural Eyes will serve; but use this Lamp or Lanthorn in dark Nights only, when Necessity obliges it: For perhaps, the Materials that this shining Matter is compos'd of, may cost the Creature some Labour to gather, tho' Nature may fit it for Use afterwards. And 'tis not unlikely that the suppos'd little Animal may have a Receptacle to preserve its shining Matter in, which it lets out when occasion requires; for this Light is no real Fire, but the Appearance only.

But altho' we are not able to give a satisfactory Account of what this Light consists of, this carries no real Objection to its being a Night-shining Fly: because

118 JACK IN THE LANTHORN,

because we are well assured, that there are flying Insects peculiar to several Countries that actually do shine in dark Nights, and yield Lights, not much different from those of our *Ignes Fatui*.

To me it seems not altogether improbable, that this suppos'd Insect may be furnish'd with a kind of natural Phosphorus, perhaps in quality not unlike the great Mr. Boyle's Noctilucal Matter, or Night-shining Stuff; which when reduced to a Powder, and put into a Phial, gently heated at the Fire, and then shook; whereby the small Particles of this shining Matter being put into Motion, would in a dark Room yield a Light very vivid. [See Mr. Boyle's Experiments and Observations made upon the *Icy*, &c. *Noctiluca*.] That the like Agitation may be performed by these shining Flies naturally, without any difficulty, either by Respiration, or by the Motion of its Wings or Legs, seems not at all improbable.

Agreeable to this is what Mr. Templer observ'd of the Glo-worm. Putting, *says he*, the Glo-worm into a small thin Box, (such as Pills are usually sent in) May 27. between Eleven and Twelve at Night, I saw her shine thro' the Box very clearly on one side, the Box shut; putting white Paper into the Box, and the Worm into the Paper, it shined through the Paper and Box both. The next Morning, about Eight of the Clock, she seemed dead, and holding her in a very dark Place, I could perceive very little Light, and that only when she was turned on her Back, and by consequence put into some little voluntary Motion. After Sun-set that Night, she walked briskly up and down in her Box, shining clearly as the Night before. The 29th in the Morning she seemed dead again, at Night recovered her self,

self, and shined as well as ever in the Box. I never, *says he*, saw her shine without some sensible Motion either in her Body or Legs. In her clearest shining she extended her Body a third part beyond its usual length. The Glo-worm having contracted her Body into a bending Posture, shined little, the Light scarcely so big as a great Pin's head; upon touching of her she extended her self, walked in her Box, and at first Extent shined as gloriously as ever. *Philosoph. Transact. N^o. 72.*

The Use that I would make of these Observations on the Glo-worm, is to strengthen the Probability that the supposed *Jack in the Lantborn Fly*, and other shining Flies, as well as the Glo-worm, emit their Light, by putting the small Particles of shining Matter into motion, from some voluntary Motion in themselves.

It has been objected, *First*, that these Lights were too large for any Insect whatever.

Second, That they were always carried along with the Wind.

Third, That they were never seen but in Salt-Marshes, or other Boggy Grounds.

And *lastly*, which seems to be the strongest of all the Objections; if this Light proceeds from a flying Insect, how comes it that the Creature has never yet been discover'd? or how was it possible to have escap'd the narrow Searches of so many curious Persons, as have with indefatigable Labour collected all the Insects possible to be procur'd, both of our own Country, and likewise from Abroad; and have with so great Care examin'd the Contexture of most Insects, as well as larger Animals, and as it were anatomised their distinct Parts; have been able to render

a consistent and rational Account of the various Uses those Parts seem'd to be designed for; and yet it should never enter into any of their Heads, that such a Creature was a nocturnal Luminous Insect, and probably the *Ignis Fatuus*, that had so long amused and puzzled Mankind to account for?

The first Objection urges the Impossibility of an Insect carrying a Light so large as the *Ignis Fatuus* appears to be.

Most Accounts agree, that these Lights commonly appear of the bigness of that of a middling Candle, and sometimes they have been seen much smaller; tho' some indeed have said, they have seen in other Countries these Appearances equal to that of a Torch. Every one knows that Light magnifies in the Night, the darker the Night, the bigger the Light seems to be; and what appear'd so luminous at a distance, the nearer you approach it the less it grows. The same has been observ'd of the *Ignis Fatuus*; which, as before said, is no real Fire, but the Appearance only. It is well known, the *Lanthorn Fly* of the *Indies*, when at Liberty, sometimes emits a Light not far short of what is reported of the biggest of our *Jack in the Lanthorn*; and this Light being contain'd in the Bladder on its Head, the Creature, as is said, can either contract, or dilate at Pleasure. The Glo-worm can encrease or diminish its shining; and very probably the supposed *Jack in the Lanthorn Fly* can do the same; or its Light appearing bigger or less, may be in proportion to the Size or Perfection of the Creature that emits it.

The second Objection is, That this Light was always carried along with the Wind. If that were true, it would be impossible for it to shun any kind

of

of Obstruction in its way, whether Man, Beast, Bank, Hedge, House, &c. but would unavoidably sometimes have been driven against some or other of them; which I never heard it was; but on the contrary shunn'd them as carefully as if guided by Sense. Besides, it can be proved by undeniable Testimony, that this Light moves any way it pleases, just as a flying Insect would do, busied in seeking its Food, sporting itself, or some other Employment. It must be own'd, indeed, that a flying Insect is generally carry'd with the Wind, not caring, or not able (especially when it blows any thing hard) to beat against it; unless it be such who have Homes, and young Offsprings to take care of, and whose Bodies are fitly balanc'd to resist such Winds. Thus far the Motion of an Insect, will agree with that of a Vapour carried by the Wind.

The third Objection, that the *Ignes Fatui* are never seen but in Salt-Marshes, or other Boggy Places; is a great Mistake. I can produce Persons of Veracity, that have seen these Lights flying over Fields, Heaths, and other dry Places. A few Days since a grave Gentleman, a Person of exceeding good Knowledge, told me, that in *Hertfordshire*, about eleven a Clock in a dark Night, he saw one of these Lights flying over a fallow piece of Ground: being within three or four Fields of his Habitation, he was perfectly acquainted with the Ground thereabouts, and well assured there was no hazard of being led into Bogs, Rivers, or other dangerous Places; his Curiosity led him to follow it, resolving, if possible, to discover what it was, (for though he had heard it was only a Vapour exhal'd from the Earth, he had

M

still

still some Doubt about it.) It led him over a plow'd Field, flying and twisting about from place to place; sometimes it would suddenly disappear, and as suddenly appear again: sometimes it would drop down, and presently rise again. Once it made directly to a Hedge but a small distance from him, which, as soon as it came pretty near, it mounted over; and he lost sight of it, after he had follow'd it a full Hour without the least Satisfaction. He then turn'd about to make the best of his way home, when presently he spied it again: but finding it next to an impossibility to approach near enough to satisfy his Curiosity about it, and being pretty well tired; gave over the Pursuit, and would follow it no further. The same Person says, That in *Surry* he has seen in a dark Night six or seven of these Lights at one time, flying over a boggy Common. And that he has seen these Appearances flying over Lands where there has been neither Ponds nor Bogs.

If the Objection to its being an Insect, because seen only in Boggy Places, would hold good; it would infallibly destroy the last Objection of its being always carried along with the Wind. For as these Lights frequently hold collected in a Body, for an Hour or more, as has been oftentimes observ'd, they might, nay certainly would (sometimes in half that time) be driven over Fields, and other dry Places, according to the strength of the Wind. But it will admit of a Doubt, whether an inflammable Vapour, would continue collected in a Body many Minutes, expos'd to so much Wind as would be sufficient to carry it along, without being very soon dissipated.

I don't deny that these Appearances are more frequently seen in Boggy, and Marshy Grounds: The Creature may very probably feed on watry Insects; and as all Animals are naturally endued with the Sense of knowing the sure Places where to find their Food, so may the *Jack in the Lanthorn* Fly likewise frequent watry Places for that very end; at which Places, as the most likely, the Males may meet and woo their Females also; the flying State being the Perfection, and last State of all the winged Tribes of Insects; in which they generate, lay their Eggs, and after which few kinds of them long survive.

This Light being often observ'd to stand still as well as move, and sometimes seeming fixed on the Surface of the Water; we may naturally suppose at such a time it settles upon the Ground, Grass, or Weeds, as other Insects do; and may perhaps either have found, and be devouring its Prey, or watching to catch it; which it could not do without the assistance of this extraordinary Light.

To the last Objection; If an *Ignis Fatuus* were only the shining of some Insect, how comes it that the Creature never yet was discover'd, &c. I reply, That the suppos'd *Jack in the Lanthorn* Fly's not being yet discover'd, may in a great measure be accounted for. All Night-Animals in general have Places of Retreat, where they hide themselves in the Day-time: to these Places of Retirement, they seem as naturally to betake themselves, as other Animals to Rest and Sleep. Some find a proper convenient Receptacle under the Earth in Holes; some in Timber, Stone, &c. others lying on the Ground, amongst Weeds, or in Hedges, hollow Trees, or under the Bark, or in the Wood, &c.

It would be endless to recount the various Methods Nature has taught these little Creatures to secure themselves from Dangers.

We all know that such Animals as fly a Nights, are sluggish and heavy in the Day-time, not caring to stir, and with difficulty are put on the Wing; hardly any thing less than their Preservation will force them to it; as the Bat, Owl, Beetle, Chafer, &c. which Creatures fly only for about an Hour in the Dusk of the Evening; and so do not stand in need of that extraordinary Light as the supposed *Jack in the Lanthorn* Fly, which is always observ'd to sally out in very dark Nights. And if those Animals are so sluggish, that fly in the Evening only; what may we suppose of the *Will with a Whisp*, which flies chiefly when late at Night.

The Glo-worm, as Mr. *Templer* observ'd, always seem'd as if dead in the Day-time; yet constantly at Night would be brisk, and shine as vivid as ever.

If by chance in the Day-time any Person should disclose the sluggish *Jack in the Lanthorn* Fly, in its Place of Shelter or Retreat, (which perhaps may have often happen'd, both in its creeping, and flying State likewise) very likely they would destroy it, as common People do most Insects as noxious Creatures; especially when large and uncommon: But if they should happen not to kill it, not one in ten thousand but would leave it where they found it, without regarding it at all.

For this reason, it is not only difficult to discover this Insect in the Day-time; but if a thousand had been found, it would be next to an Impossibility to know they were shining Flies; because the Part that

con-

contains the luminous Matter, like that of the *Indian* *Lanthorn* Flies, appears by Day-light only clear and pellucid, without any shining at all. Besides, it may perhaps be an Insect not of the multiparous kind, consequently the seldomer to be met with.

The Difficulty of catching this supposed Insect by Night, has been as great hitherto, as that of knowing it by Day. For *Ignes Fatui*, as all agree, appear only in dark Nights, and commonly when late; at which time the benighted Traveller wants to be at Home, or perhaps the Stories he has heard of the *Jack in the Lanthorn's* leading such as follow it into Rivers, and other dangerous Places, deterr him from going after it. But if it happen'd he was neither in haste, nor afraid; it would be almost impossible to follow it in a dark Night, amongst Bogs, Lakes, &c. where this Insect is usually sporting and frisking over the Waters. Should we not conclude the Person, that would perhaps risque his Life in attempting to catch what he thinks a Vapour, more infatuated than the *Ignis Fatuus* he is in pursuit after.

It was never yet known that any Person approach'd so near this Light, as to discover certainly what it was. But as some Persons have attempted to draw near it for that intent (when by chance they have seen it in a Place easy of Access, tho' not one in a thousand have had the Courage to venture) the cunning Vapour, as if sensible of their Design, and for its own Security, withdraws its Light, as it were a dark *Lanthorn*, and takes that opportunity to escape; leaving the *Ignis Fatuus* Hunter in the dark amongst Bogs and Fens, to find his way out again; whilst *Jack in the Lanthorn* appears again, two or three

hundred Yards off, sporting over the Brooks and Meadows, exercised in its beloved Employment.

It appears upon the whole, that the various Properties observable in these Lights carry evident Marks of Sense; to attribute them therefore to fired Vapours moving without any Direction, is an Explication that renders the Subject but more unintelligible.

The late ingenious *R. Bradley*, F. R. S. his Opinion of these Appearances was as follows. The *Ignis Fatuus*, says he, or *Jack in the Lanthorn*, I suppose to be no more than a Group of small enlightened Insects, rather than suppose it an inflammable Vapour, as some have taken it to be; for if it consisted of such Effluvia or Corpuscula as rise from the Earth or Waters, that were inflammable, and by some Cause or other had taken Fire, they could not be of so long lasting or duration as we find them to be; and besides, we might as reasonably expect, that all the Effluvia arising at the same time from the same Body of Water, should equally be inflammable as these; and so the whole Surface of the Pond, Lake, or River, appear all in a Flame at one time. The sudden motion of this Light from Place to Place, very much agrees with the Motion observable in Groups of Gnats, which move in a Body, sometimes very slowly, and at other times drive together with great swiftness. Happening, says he, to discourse upon this Subject with the ingenious Mr. *Godfrey* the Chymist, that Gentleman told me, that he had often observ'd this enlightened Body in some Places abroad, and had caught some of the Insects which help'd to compose it. But allowing it to be as I say, the occasion of the Light in such Insects remains yet to be discover'd.

Of all the Accounts that I have had from Variety of People that have seen these Lights, and with which I could have fill'd a large Volume, I find no material difference in their several Relations; only that some, and indeed the most, have seen them in watry and boggy Places, others have seen them in dry Grounds; to some these Lights appear'd of the bigness of that of a middling Candle (which most agree in) to others bigger, and to some smaller. I shall therefore add no other Relations but what follows, from the *Philosophical Transactions*.

Of the Meteor call'd the *Ignis Fatuus*, from Observations made in *England* by the Rev. Mr. *W. Derham*, F. R. S. and others in *Italy*, communicated by Sir *Tbo. Dereham*, Bart. F. R. S. N^o. 411. p. 204. *Philos. Transact.*

It being the Opinion of divers skilful Naturalists (particularly Mr. *Fran. Willughby* and Mr. *Ray*) that the *Ignes Fatui* are only the shining of a great Number of the Male Glo-worms in *England*, or of the *Pyraustæ* in *Italy*, flying together: I was minded to consult my curious and ingenious Friend Sir *Thomas Dereham* about the Phænomenon; being informed, that those *Ignes Fatui* are common in all the *Italian* Parts. But of the *Pyraustæ*, or Fire-Flies, he saith, he never observed any such Effects, altho' there is an immense Number of them in *June* and *July*. He saith moreover, that these *Pyraustæ* are called *Lucciole*, i. e. small Lights; and that they are not the *Farfalls* (as Mr. *Ray* thought) which are Butterflies. But I have good reason to think, that Insects are not concerned in the *Ignes Fatui* from the following Observations; the first of which I made my self,
and

128 JACK IN THE LANTHORN,

and the others I received from *Italy*, by the Favour of Sir *Tho. Dereham*.

My own Observations I made at a Place that lay in a Valley between rocky Hills, which I suspect might contain Minerals, in some boggy Ground near the bottom of those Hills. Where seeing one in a calm dark Night, with gentle Approaches I got up by degrees within two or three Yards of it, and viewed it with all the Care I possibly could. I found it frisking about a dead Thistle growing in the Field, until a small Motion of the Air (even such as was caused only by the Approximation of my self) made it skip to another place, and thence to another, and another.

It is now about fifty five Years since I saw this Phænomenon; but I have as fresh and perfect an Idea of it, as if it was but a few Days. And as I took it then, so I am of the same Opinion now, that it was a fired Vapour.

The Male Glo-worms I know emit their shining Light as they fly; by which means they discover and woo their Females: but I never observed them to fly together in so great Numbers, as to make a Light equal to an *Ignis Fatuus*. And I was so near, that had it been the shining of Glo-worms, I must have seen it in little distinct Spots of Light; but it was one continuous Body of Light.

Thus far the Doctor has related his own Observation of an *Ignis Fatuus*. Before I mention the Observations which Sir *Tho. Dereham* procured for him in *Italy*; I cannot help remarking, that in the above Account the Dr. has given of an *Ignis Fatuus*, there appears a much stronger Argument of its being

ing a living Creature, than a Vapour: For when with gentle Approaches he got up by degrees within two or three Yards of it, he found it frisking about a dead Thistle growing in the Field, until a small Motion of the Air (even such as was caused only by his continual gentle approach) made it skip to another Place, and so to another, and another. Its frisking and playing about a Thistle, agrees much better with that of an Insect, exercised in seeking its Food, or some other delightful Employment; as does its skipping from place to place likewise. For I can hardly think it possible that the Air agitated only by his Body, considering how gently he approach'd the Light, could have been sufficient so to affect it, at two or three Yards distance, as to have driven it from him; but if this was really the Cause of its first remove, its second, third, and after removes from place to place, must be owing to something else: And as it was a calm Night, we cannot attribute its flight to the Wind; nor does the Doctor in the least assign that as the Cause, any further than what proceeded from his own slow easy Motion, which was to my thinking insufficient to effect it: Besides, if the Motion of the Air was the only Cause of this Light's moving from place to place; it could not be carried along in one continuous Body of Light, but would at least be spread, if not soon dissipated: But an Insect busied in seeking its Food, or some other Employment, we may naturally suppose, that as soon as ever it perceived itself discover'd (which it might do by the help of its Light) it wou'd move off, in order to secure itself from any appearing danger: And this Solution of the Motion of the *Ignis Fatuus* seems

130 JACK IN THE LANTHORN,

to me more agreeable to Truth than that of a Vapour. And as to the Light's exceeding that which the Male Glo-worm emits flying; and that he never observ'd them to fly together in so great Numbers, as to make a Light equal to an *Ignis Fatuus*; there seems good reason to believe, that all shining Flies can at pleasure add or diminish their Light, or perhaps the Light's being more or less, may be owing to the Size or Perfection of the Creature. But I believe it is not a collective Body of small Insects that composes the *Ignis Fatuus*; but rather one single Animal, which of what Tribe it belongeth to, remains yet to be discover'd.

The *Lanthorn-Fly* of the *Indies*, seems to be of the Papilionaceous kind; tho' the *Indians* say it is produced from the Insect Fig. 3. pag. 52. which agrees better with the Chafer or Beetle kind, than that of the Butter-fly. But whether the *Ignis Fatuus* be of the Papilionaceous, Libella, Beetle-kind, or any other, it must remain a Doubt, till time discovers it: And all that is intended in this Attempt, is only to show the probability of its being a living Animal, rather than a Vapour; because many of the Circumstances agree well with the former, and hardly one with the latter.

The Observations which Sir *Tho. Dereham* procur'd for the Doctor in *Italy* agreeing in the general with most other Relations, and the whole being too long to insert, I shall only extract the Heads of what that Gentleman has deliver'd; and then leave the Argument to some abler Hand, whose Time and Abilities are better suited to examine the Subject.

In

In *Italy* there are of these Lights both on the Mountains, and in the Plains; and are pretty common in all the Territory of *Bologna*. To begin with the Plains: They are frequently observed there; the Country People call them *Cularsi*; perhaps from some fancied Similitude to those Birds, and because they look upon them as Birds, the Belly and other Parts of which are resplendent like our shining Flies. They are most frequent in watry and morasse Ground, and there are some such Places, where one may be almost sure of seeing them every Night, if it be dark. In the Fields near the Bridge *Della Calcarata*, in a Common belonging to a Parish of *S. Maria in dono*, North of *Bologna*, one of these fiery Appearances is very often observed to move across the Fields, coming from another Bridge. There is another of them in the Fields of *Bagnara*, almost East of *Bologna*, which scarce ever fails to appear in dark Nights; particularly when it rains, or snows, as also in cold and frosty Weather: Both these Lights are very large; that at *Bagnara* appeared to a Gentleman, as he was travelling that way; it kept him Company for a Mile or better; constantly moving before him, and casting a stronger Light on the Road than the Link he had with him.

Lesser ones there appear a good many, some of them giving as much Light as a lighted Torch, and some there are no bigger than the Flame of a common Candle. All of them have the same Property, in resembling both in Colour and Light, a Flame strong enough to reflect a Lustre upon neighbouring Objects all around. They are continually in Motion, but this Motion is various and uncertain. Sometimes they rise up, at others they sink: sometimes they

they disappear of a sudden, and appear again in an instant in some other Place. Commonly they keep hovering about six Feet from the Ground. As they differ in largeness, so they do in figure, spreading sometimes pretty wide, and then again contracting themselves: sometimes breaking to all Appearance in two, and a very little while after meeting again into one Body; sometimes floating like Waves, and letting drop some Parts like Sparks out of a Fire. I have been assured, that there is no dark Night all the Year round when they do not appear. And in the very middle of the Winter, when the Weather is very cold, and the Ground cover'd with Snow, they are observed more frequently than in the hottest Summer. Nor doth Rain or Snow in any wise prevent or hinder their Appearance; on the contrary, they are more frequently observed, and cast a stronger Light in rainy and wet Weather. Neither doth the Wind much hurt them, tho' one should think, that if it was a burning Substance, like common Fire, it should either be dissipated in windy Weather, or extinguished by Rain; (and the same we might expect if it was a Vapour.) But since they do not receive any damage from wet Weather, and since on the other hand it hath never been observed, that any thing was thereby set on Fire, tho' they must needs in moving to and fro meet with a good many combustible Substances; it may from thence be very reasonably inferred, that they have some resemblance to that sort of Phosphorus which doth indeed shine in the dark, but doth not burn any thing, as common Fire doth. As to the appearance of this Phaenomenon in mountainous Parts, by what I have hitherto been able to learn, they differ in nothing

nothing else but in largeness; and all those I conversed with, that saw them in the Mountains, agree in that they never observed any larger than the Flame of an ordinary Candle. Nor do those that live in the Mountains call them *Cularsi*, which Name is perhaps used only by the Country People in the Plains, for those large ones above described. One thing I will beg leave to add, that according to the best Informations I have been able to procure, these Lights are great Friends to Brooks and Rivers, being frequently observed along the Banks of them, perhaps because the Air carries them thither more easily than any where else. In all other particulars, as in their Motion, the manner of their Appearance, their disappearing sometimes very suddenly, their Light, the Height they rise to, and their not being affected either by rainy or cold Weather, they are the very same with the *Cularsi* above described, or the large *Will with a Whisp*, as observed in the Plains.

A young Gentleman, a very accurate and knowing Observer of Natural Appearances, travelling some time in the Month of *March* between eight and nine in the Evening, in a mountainous Road not far from our Lady *Del sarso*, about ten Miles South of *Bologna*, as he approach'd a certain River called *Rioverde*, he perceived a Light, which shone very strongly upon some Stones that lay upon the Banks. It seemed to be about two Feet above the Stones, and not far from the Water of the River: In figure and largeness it had the Appearance of a Paralleloepid, somewhat above a *Bolognese* Foot in length, and about half a Foot high, its longest side lying parallel to the Horizon: Its Light was very strong, insomuch that he could very plainly distinguish by it part of a neighbouring Hedge, and the Water in the River; only in

134 JACK IN THE LANTHORN,

the East corner of it the Light was pretty faint, and the square Figure less perfect, as if cut off, or darkened by the Segment of a Circle: The Gentleman's Curiosity tempted him to examine it a little nearer; in order to which he advanced gently towards the Place, but was surprized to find, that insensibly it changed from a bright red to a yellowish, and then to a pale Colour, in proportion as he drew nearer; and that when he came to the Place itself, it was quite vanished. Upon this he stepped back, and not only saw it again, but found the farther he went from it, the stronger and brighter it grew; nor could he upon narrowly viewing the Place where this fiery Appearance was, perceive the least blackness, or smell, or any Mark of an actual Fire. The same Observation was confirmed to me by another Gentleman who frequently travels that way, and who assured me, that he had seen the very same Light five or six different times, in Spring and Autumn, and that he had always observed it in the very same Shape and the same Place; which to me seems very difficult to be accounted for. He told me farther, that once he took particular notice of its coming out of a neighbouring Place, and then settling itself into the Figure above described. How it comes to pass, that the nearer one approaches to these, or the like fiery Appearances, the fainter they grow, till at last they disappear totally, I freely own my self at a loss. This is the Substance of what I have been able to gather from several Accounts relating to the *Ignes Fatui*; but as to the Causes of them I will not pretend to assign any: I will only add, that all that ever saw any of these fiery Appearances agree, and you may assure Mr. *Derham* of it, that they cast a Light quite different from that of the shining Flies; and if you please

please to reflect on the several Circumstances above related, I believe you will find, that they are not easily, if at all, to be solved by that Hypothesis.

Notwithstanding this Conclusion of Sir *Tho. Derham's*, from the Circumstances of his Relation, I am more strongly inclin'd to believe the Light proceeds from a living Animal than I was before. For let any Person but examine the particulars of the Account Sir *Thomas* has given of the *Ignes Fatui*; and try how far he can reconcile them to the Appearance, or Notion of a mere Vapour.

In *Italy*, he says, there are observ'd two kinds of these Lights, one on the Mountains, the other in the Plains; those in the Plains are the largest. The Country People call them *Calarfi*, because they look upon them as Birds, the Belly and other Parts of which are resplendent like their shining Flies; that is, their *Pyrausta*, or Fire-Flies, &c.

One of these fiery Appearances was often observ'd to move across the Fields, coming from one Bridge to a Spot of Ground near the other. Would a fired Vapour, think ye, be so often raised at the same Place, of the same size, and so constantly go to the same Spot, and there fix it self? Can such an Action be reconcil'd to the Notion of a Vapour? Is it not more agreeable to that of Sense? It rather looks as as if some shining Animal fallied out at such a time from its lurking Hole, or Place of retreat.

Another of these larger Lights appear'd to a Gentleman as he was travelling, and kept him Company for a Mile or more, constantly moving before him. How a Vapour could do this, is beyond my Comprehension, or I believe any one's else. As to the different Magnitudes of this Light, that is undoubtedly owing to the different Creatures that emit it,

or perhaps to the size or perfection of the Insect.

The *Ignis Fatuus* appearing in a dark Night in any Weather, as Rain, Snow, and the like; at which times they are observ'd to cast a stronger Light; agreeeth much better with an Animal than a Vapour; because the shining Matter in an Insect being enclos'd, can receive no damage from any kind of Weather: whereas a Vapour would either not be exhaled, or would soon be dissipated by the weight of the Rain, &c. But an Insect at such a time stands in need of more Light, and therefore displays its utmost.

As to the *Ignis Fatuus* that appear'd to the young Gentleman, in figure and size of a Paralleloepid, &c. which Observation was confirmed by another Gentleman, who frequently travelled that way, that he had seen the very same Light five or six different times, in Spring and Autumn; and that he had always observed it in the very same shape, and the same place; and that once he took particular Notice of its coming out of a neighbouring Place, and then settling itself into the figure above described; let any Person but duly consider the Circumstances above related, and (as I said before) try if they can be reconciled to the Existence and motion of a Vapour. Sir Tho. Dereham freely owns himself at a loss to account for this; as well he might in supposing it a meer fired Vapour. Mistaken Notions, by skilful Advocates, are often made to appear like Truth; but Truth itself, though defended by far meaner Parts, generally carries a stronger Conviction.

P O S T S C R I P T.

THE following Account of an *Ignis Fatuus* I had from an intimate Friend, an Apothecary in London, since the foregoing Dissertation on this Subject

ject was sent to the Press: Its confirming in a great measure some things that I deliver'd as Conjectures only, made me the more willing to insert it.

Himself, in company with two other Persons, saw one of these Appearances in a Garden about nine of the Clock in a dark Night: They at first imagin'd it some Country Fellow with a Lanthorn, till approaching within about six Yards, it suddenly disappeared; and in a small space of time appear'd in a dry Field, about thirty or forty Yards off. It disappear'd as suddenly a second time, and was seen again near an hundred Yards off; from thence it removed to a further distance, and so to a further; till at length they spied it in another Field, parted from the first by a thick Hedge, and so from Field to Field. Whether it went over, or through the Hedge, could not be observ'd, because it passed from one Field to the other whilst dark.

This Gentleman told me he had seen this Light divers times afterwards; it always appeared the same, without any discernable difference either in bigness or figure, and that several other Persons had seen it likewise.

Once he saw this Appearance in a dry Field, fixed, without Motion; the same two Persons being with him that saw it in the Garden the first time, agreed to try how near they could get to it; and having approach'd within ten or twelve Yards, one of the Persons was for running to catch it; which hasty Proceeding made it immediately vanish: It appear'd again at little distances as before, but seem'd to pack away as it were in a Fright.

These Observations were made at *Astley*, seven Miles from *Worcester*.

T A B L E

OF THE

ANIMALS and VEGETABLES

Describ'd in this Volume.

BOOK I.

Of four-footed BEASTS.

B ezoar Goat	Page 1
Musk-Goat	2
Shamoy, or Rock-Goat	3
Shagreen	ibid.
Antelope	4
Sea Skink	ibid.
Indian Man-Tiger	5
African Man-Tiger	ibid.
Wood Dormouse	6

BOOK II.

Of BIRDS.

A vofetta	Page 7
Bearded Titmouse	8

BIRDS.

Jacobine Pigeon	Page 8
Frigate Bird	9
Bengal Jay	10
Bengal Quail	ibid.
Bohemian Jay	11
Banana Bird	ibid.
Warwoodwen	12
Little Owl	13
Little Horn-Owl	ibid.
Hoopoe Cock	14
Hoopoe Hen	ibid.
Flamant	15
Carasow Cock	16
Carasow Hen	ibid.
Red Bird	17
Ganser	ibid.
Red-wing'd Starling	18
Red-legg'd Horseman	ibid.
Green Crown-Bird	19
Long-tail'd Humming Bird	ibid.
Porphy-	

A T A B L E, &c.

B I R D S.	
<i>Porphyrio</i>	Page 20
<i>Amadavad Bird</i>	21
<i>Crown Bird from Mexico</i>	ibid.
<i>Bird of Paradise</i>	22
<i>Cock Maccaw</i>	23
<i>Hen Maccaw</i>	24
<i>Yellow Lawrey</i>	25
<i>Green Paroquet</i>	ibid.
<i>Green Parrot</i>	26
<i>The Lawrey</i>	ibid.
<i>Batt</i>	27

B O O K I I I. O F F I S H E S.

C uttle Fish	28
<i>Croker</i>	29
<i>Bone-Fish</i>	30
<i>Ising-glass Fish</i>	ibid.
<i>Black-Tail</i>	31
<i>Sea Squirrel</i>	32
<i>Skip-jack</i>	33
<i>Green Eel</i>	ibid.
<i>Fresh Water Perch</i>	34
<i>Rudder-Fish</i>	ibid.
<i>Lane Snapper</i>	35
<i>Sea Hawk</i>	ibid.
<i>Bahama Unicorn-Fish</i>	36
<i>Blue Fish</i>	37
<i>Old Pudding-Wife Fish</i>	38
<i>Hog-Fish</i>	39
<i>The Grunt</i>	40
<i>Pork-Fish</i>	41
<i>Schoolmaster Fish</i>	42
<i>Old-Wife</i>	43
<i>Old Husband Fish</i>	44
<i>Yellow Fish</i>	45
<i>Negro Fish</i>	ibid.

F I S H E S.	
<i>The Tang</i>	Page 46
<i>Rock-Fish</i>	47
<i>Hind-Fish</i>	48
<i>Shad</i>	49
<i>Soldier, or Craw-Fish</i>	ibid.

B O O K I V. O F I N S E C T S.

A Curious Indian Caterpillar	51
<i>A Fly produced from the above Caterpillar</i>	ibid.
<i>An Indian Chafer</i>	52
<i>A Fly from that Chafer</i>	ibid.
<i>Silkworms</i>	53
<i>Butterfly</i>	56
<i>A curious Indian Beetle</i>	57
<i>An Indian Black Beetle</i>	ibid.
<i>An Insect that feeds on the Grape</i>	58
<i>A beautiful Indian Chafer</i>	59
<i>Locust</i>	60
<i>Cock-rock</i>	61
<i>A large Indian Spider</i>	62
<i>English Spiders</i>	63
<i>Curious Observations on the Jumping Spider</i>	64
<i>— on the Carter, or Long-legg'd Spider</i>	67
<i>Tarantula</i>	70
<i>Ants, or Pismires</i>	73
<i>Blue Fly</i>	76
<i>Book-Worm</i>	79
<i>Book-Spider</i>	81
<i>Weevil, or Corn-Beetle</i>	82
<i>Indian Frog, &c.</i>	83
<i>Indian Lamborn Fly</i>	111

A T A B L E, &c.

BOOK V.

Of PLANTS, FRUITS,
and FLOWERS.

Coffee	Page 85
Tea	86
Cacao, or Chocolate Tree	87
Sugar Cane	88
Nutmegs and Mace	89
Cinnamon	90
Cloves	92
Pepper	93

PLANTS, &c.

Ginger	Page 94
Currants and Raisins	95
Pomegranate	96
Rice	97
Cork-Tree	98
Tobacco	99
Cotton	101
Mandrake	102
Balm of Gilead	104
Cedar of Libanus	105
Ananas	106
Great American Aloe	107
Sensible Plant	109

